The RUBBER AGE

VOL. 25, NO. 2 APRIL 25, 1929

Late News of the Rubber Industry

Preliminary Statistics Show Tire Dealers' Stocks Higher

PRELIMINARY reports of the annual spring survey of tire dealers' stocks of the Rubber Division of the United States Department of Commerce show that on April 1, 1929, 20,848 dealers held an average stock of 90.3 automobile and truck casings. This is 9.1 tires per dealer greater than on April 1, 1928, and 19.7 greater than on April 1, 1927.

Dealers reporting stocks of balloon casings had an average of 63.7 per dealer, an increase of 18 tires over last year. Balloon casings constituted 56.7 per cent of total casings this year as compared to 36.4 in April, 1928. Inner tubes held by dealers average 137.9 as compared with the figure of 123.4 for April 1, 1928.

The increase in average stocks per dealer as compared with April 1, 1928, is about the same as the increase in October, 1928, over October, 1927. Tire dealers on the average are now carrying larger stocks than formerly. The Department of Commerce concludes from the lower number of returns to its questionnaires received in the last two surveys as well as the numerous reports stating that recipients no longer handle tires that a considerable number of former tire dealers have withdrawn from the business.

An analysis has been prepared of the reports from dealers having stocks of casings and a comparison made with the survey of April, 1928. This year a smaller percentage of reports fell into the classes of dealers having less than 100 casings in stock. Dealers holding more than 100 casings comprised 19.78 per cent of the total as compared with only 16.18 per cent a year ago.

In the present survey for the first time, the National Tire Dealers' Association co-operated with the Rubber Division by urging its members to report, and the higher percentage of dealers who reported stocks of more than 100 casings is believed to be a result of this co-operation. Consequently, the present reports, including returns from N. T. D. A. members not previously reporting, are not exactly comparable with those of April, 1928.

Automotive Parts Industry Has Record First Quarter

MANUFACTURERS of automotive parts and equipment, keeping pace with the record car and truck production, have had the greatest first quarter in the history of the industry and in all probability will have a record first half, as well. Wholesalers of service parts, accessories and shop equipment likewise enjoyed better business than last year, according to the Motor and Equipment Association.

Aggregate shipments of parts, accessories and garage equipment manufacturers to vehicle makers and the wholesale trade in February reached an index figure of 212 per cent. of the January, 1925, base, which is 100, a new record high, as compared with 188 in January this year, 171 in February last year, and 146 in February, 1927. Both shipments of parts and accessories to the car makers and of garage repair equipment to the trade scored records.

Although figures for March are not yet available, original equipment makers, as well as makers of service parts and garage equipment for the wholesale trade, operated throughout March at levels considerably ahead of last year, thereby assuring a record first quarter.

Pacific Airship Lines Forecast by Litchfield

THAT it is perfectly practical and safe to run a regular dirigible service between Los Angeles and Honolulu was asserted by Paul W. Litchfield, president of the Goodyear Tire & Rubber Company and the Goodyear-Zeppelin Corporation, in a speech before the members of the New York Bond Club in that city on April 12.

After commenting on the development of radio, the invention of duralumin, and the perfection of the lightweight gasoline engine, Mr. Litchfield discussed the ability to recover condensed gases from the fuel consumption by mixing with air forming water and taking it back as ballast for the ship. This last process, an important one in airship building, will be used for the first time in the two dirigibles being built at Akron for the United States Navy. In its trip across the Atlantic, the *Graf Zeppelin* used "blau" gas, of the same weight as air, so that the ship did not lose ballast by the consumption of fuel.

"We are waiting only for the development of a number of the large ships that we are building for the Navy to make it evident that they are practical and safe," Mr. Litchfield declared. "One of the most ideal places to prove that these ships are safe is the route from California to Hawaii, where the wind and weather conditions are ideal for airship transportation, and we feel it is perfectly practical and safe, and will be profitable to run these ships leaving Los Angeles on Saturday night and reaching Honolulu on Monday and back to Los Angeles by Wednesday night.

"The airships we are building for the Navy are three times the size of the *Los Angeles* and two and a half times the size of the *Graf Zeppelin*. You know what the risks in this type of travel are, but I want to call your attention to the fact that the Atlantic has been crossed five times by dirigibles, with ships much smaller, much weaker and much

slower than the ships designed for that purpose today. These two new Navy ships are of 6,500,000 cubic feet capacity."

Goodrich Sales Show Increase; Aviation Leader Made Director

PROFITS and piece sale volume of the B. F. Goodrich Company for the first quarter of 1929 were greater than during the first three months of last year, it was announced by officials of the company following the annual stockholders' meeting in New York City on April 17. No figures were given out by S. M. Jett, secretary, on the amount of the increased business.

The stockholders elected Clement M. Keys, president and chairman of the board of the Curtiss Aeroplane & Motor Company, to the directorship left vacant last year by the death of H. E. Raymond. Mr. Keys, who has been the head of the Curtiss organization since 1920, is also chairman of the executive committee of the National Air Transport, Inc., and president of C. M. Keys & Company, bankers and brokers. His selection as a Goodrich director is believed significant in view of the rapidly increasing production and sale of airplane tires and other rubber accessories.

Photo Blank-Stoller

C. M. KEYS

The other directors of the company whose terms expire this year were re-elected. They are D. M. Goodrich, C. B. Raymond, C. E. Cook and Mr. Jett. At the directors' meeting immediately following the meeting of stockholders, officers of the company were re-elected, and the delivery of stock was authorizd against the stock subscription warrants exercised not later than 3 p. m., April 24.

The stockholders voted to retire 11,880 shares of preferred stock in accordance with the charter provisions and authorized the increase of common shares from 1,000,000 to 1,500,000. The date of the annual meeting was changed from April to the first Wednesday in May, and by-law amendments were approved authorizing fac simile signatures and corporate seal on stock certificates and permitting a record date of instead of closing transfer books for future meetings of stockholders.

Garlock Packing Company Offers Stock to Public

WHITE, Weld & Co., J. A. Sisto & Co., the Marine Trust Company of Buffalo, N. Y., and Sage, Wolcott & Steele, Rochester, N. Y., offered to the public on April 10, $3,000,000 of ten-year 6 per cent convertible debentures of the Garlock Packing Company, Palmyra, N. Y., priced at $97.50. The same houses, with the exception that Marine Union Investors, Inc., replaced the Marine Trust Company, also offered 100,000 shares of no par common stock of the same company, priced at $23 a share. Each $1,000 debenture is convertible at any time prior to the date of maturity or redemption into 35 shares of common stock.

The Garlock Packing Company, the largest producer in the United States of rubber and other mechanical packings, is the outgrowth of a business organized in 1887. The packings produced by the company are used to prevent the leakage of steam, water, air, oil and other liquids and gases in the operation of pumps, compressors, engines of the steam, gas and Diesel types, pipe lines and nearly all types of power machinery.

Active customer accounts number approximately 60,000 and the products are sold in every state, in Canada, Central and South America, Europe and the Far East through 27 branch offices. The company's principal plants at Palmyra, N. Y., occupy 48 acres. Under the new financing, the present management of the company will continue to direct its affairs, but the banking houses will be represented on the board of directors. The executive personnel have an average length of service with the company of over 15 years. The new board of directors will include George F. Rand, president, Marine Trust Company of Buffalo; Rudolph B. Flershem, vice-president, Marine Trust Company of Buffalo; Raymond V. V. Miller and W. G. Lasher, of White, Weld & Co.; David S. Rutty, of Sage, Wolcott & Steele; J. C. Nelson, vice-president, Syracuse Washing Machine Corporation; S. R. Hickok, president, Hickok Belt Company; George L. Abbott, president, Garlock Packing Company; and Charles C. Congdon.

The Garlock Packing Company has shown a net profit in every year since its organization, with the exception of 1921. Net profits, after depreciation but before federal taxes, have averaged $684,049 annually for the past five years. After interest charges and federal taxes, this would have been equal to earnings of $2.21 a share on the common stock, and for 1928 the company's income was equivalent to $2.87 a share on the common. As of December 31, 1928, total current assets were $2,449,150 as against total current liabilities of $336,056.

Kelly-Springfield Decides To Retire All Funded Debt

FOLLOWING the current trend in industrial financing in replacing funded debt with equity securities, the Kelly-Springfield Tire Company will on May 15 redeem at $110 and interest all its outstanding 8 per cent serial notes. The retirement of these notes, voted by the board of directors on April 9, will be effected out of the proceeds of the new common stock sold last October and will leave the company without funded debt of any kind. The notes were originally issued in an amount of $10,000,000, of which $3,221,700 are still outstanding.

In calling the note issue for redemption, the directors are carrying out to completion the program instituted last fall, when shareholders voted to change the common stock of the company from $25 par to no par value, increasing the authorized issue to 1,200,000 shares, of which 700,000 shares were sold at $21 each. The complete success of this financing was attributed to a group of prominent financiers who were thought to have bought control of the company through the purchase of rights to the common stock. This belief has never been substantiated, but the company did obtain more than $14,000,000 additional working capital.

Part of the proceeds were immediately applied to the liquidation of bank loans in excess of $7,000,000, and a sufficient amount was set aside to redeem the remaining sinking fund gold notes on May 15, leaving the company free of debt of any kind. Although the company showed a loss of $2,490,512 last year, its balance sheet as of December 31 was most favorable, showing current assets of $16,830,297 against current liabilities of $1,029,232. After the retirement of the present notes, it is expected that the company will still show a ratio of current assets to current liabilities of better than 12 to 1.

Through the additional interest saving resulting from the retirement of the notes and the strengthened position as

regards working capital, the company is expected to be able to realize full benefits of the improvements in operations now under way. The company is understood to be making satisfactory progress in sales and earnings at the present time.

Goodyear Selects Location For New Tire Fabric Mill

DECISION of the Goodyear Tire & Rubber Company to build a 50,000-spindle tire fabric mill at Rockmart, Ga., was announced recently by C. C. Slusser, vice-president and production manager. The new mill is expected to be completed by next fall and will employ 1,100 persons. Rockmart is 14 miles north of the company's present Southern cotton mill at Cedartown, which has the same production capacity as the new plant will have, recently being increased from 35,000 to 50,000 spindles.

The Goodyear company has purchased 350 acres of land at Rockmart, a town of 2,500 population. Approximately 400 houses will be built for employes of the new mill, and the total investment by the company will be about $3,500,000.

Establishment of the new fabric unit will give the company six mills for the manufacture of its own requirements, enabling it to provide a large share of the tire fabric used in Goodyear's eight tire factories. Other fabric mills are located at Los Angeles, Cal., supplying the needs of the tire plant there; two in the east at Goodyear, Conn., and New Bedford, Mass., and one at St. Hyacinthe, Que.

Other manufacturing units to be completed by the Goodyear organization in its expansion program this year are the new Southern tire plant and reclaiming mill at Gadsden, Ala., and an airship factory and dock at Akron, O., to be the world's largest single-story building under one roof, in which will be assembled the first of the two giant dirigibles for the United States Navy.

Dayton Sues Allis-Chalmers, Charging Restraint of Trade

DECLARING that the Allis-Chalmers Manufacturing Company, Norwood, O., is interfering with its trade by a campaign of intimidation and threats of infringement suits against its customers, the Dayton Rubber Manufacturing Company, Dayton, O., filed suit in Federal Court last month, asking an injunction against further alleged restraint of trade.

The Dayton company sets forth that the defendant firm has threatened its customers with suits on infringement of patents on fan belts, but claims that the threats were begun even before the Geist patent, over which the suit is brought, was issued on March 13, 1928. As a result, the plaintiff company has been forced to suffer large cancellations of orders and contracts by firms alleged to have been threatened, the bill of complaint says, and likewise has suffered large financial losses.

The Dayton Rubber Manufacturing Company says that it makes V-shaped rubber and fabric belting under the Short and Freedlander patents and has done so long before the Geist patent was issued. It further states that it has invested large sums in this business and that its products are not infringements of the Geist patent. According to the Dayton company, the Geist patent is invalid, having been anticipated in use by the Lipman Refrigerating Company of Beloit, Wis.

Declaring that it has been invited by Allis-Chalmers to bring suit to test out the validity of the Geist patent, the Dayton company asks that the court give it permission to prove its case concerning permits, and points out that the Lipman company, now known as the General Refrigerating Company, has refused to provide proofs of the prior patent, as sought.

U. S. Rubber Elects Directors; New Akron Plant is Rumored

STOCKHOLDERS of the United States Rubber Company at the annual meeting in New Brunswick, N. J., on April 16, elected nine new directors. Five of the new members of the board displace as many directors who have resigned, while the others were added to the board. The stockholders approved the plan to increase the number of directors to twenty, and the election of the new directors marked the representation of the du Pont interests in the company.

The new directors are Edward J. Coughlin, Victor M. Cutter, William de Krafft, James Deshler, Percival Dixon, Henry F. Miller, Herbert E. Smith, Lewis L. Strauss, and Lucius D. Tompkins. Mr. Cutter is president of the United Fruit Company, Mr. de Krafft is vice-president in charge of finance and treasurer of the Baldwin Locomotive Works, and Mr. Strauss is a member of Kuhn, Loeb & Company. Five of these new directors take the place of John W. Davis, Henry L. Hotchkiss, Samuel L. Nicholson, Homer Sawyer and Charles B. Seger.

F. B. Davis, Jr., the new president of the company, told the stockholders that sales for the first three months of the current year show a substantial increase in quantity and, notwithstanding lower selling prices prevailing this year, are practically the same in dollar volume as for the comparable period of 1928.

The United States Rubber Company at the end of 1928 set aside a reserve of $10,000,000 out of its surplus to provide for the disposition of such of its factories which have already been shut down or are about to be shut down, together with improvements of manufacturing facilities in other units. This action was believed to have been taken as part of a program of consolidation and centralization of manufacturing facilities, closing down and disposing of plants which have been operating without and generally instituting operating economies under what is considered as the new du Pont management.

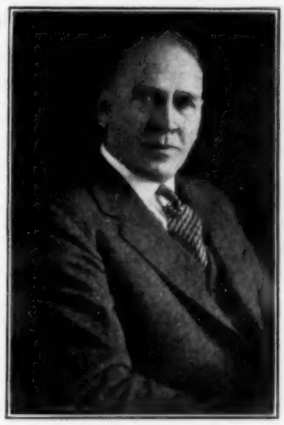


Photo Blank-Stoller
V. M. CUTTER

Business men and city officials of Akron, however, have construed this action as indicating an intention of the company to construct a new $10,000,000 centralized plant and have organized a campaign to induce the company to locate in Akron. A special committee of the City Council met with officials of the Akron Chamber of Commerce on April 12 to discuss extending an invitation to the United States Rubber Company, and the Akron Industrial Foundation is also reported to have joined with the other groups in the matter. Council President E. L. Marting appointed Councilman Henry Nelson, Dan E. Selby and George Falor to the special committee, and Vincent Stevens, secretary of the Chamber of Commerce, declared that he would take up with William A. Boesche, chamber president, whether a special committee or a standing committee of that body would handle the proposal.

The Akron *Beacon Journal* in a leading editorial en-

titled, "Come to Akron, U. S. Rubber," described the advantages for rubber manufacturing which Akron possesses, including "its water supply, of a chemical nature ideal for the curing of rubber," and declared, "These offerings ought to be attractive to the United States Rubber Company, whose last yearly report showed that it had not prospered so well because the plants in which its operations are conducted are so widely scattered." The Cleveland *Plain Dealer* on April 13 stated, "It is understood that representatives of the United States Rubber Company already have visited Akron to inspect prospective sites for their new factory."

Rubber Association to Compile Monthly Statistics of Footwear

THE Footwear Division of the Rubber Association of America, Inc., at a meeting held at the Yale Club, New York City, on April 4, decided to compile monthly statistics of production, sales and inventories of rubber footwear. The work of compilation will be done by the association.

E. G. Holt, chief of the Rubber Division of the Department of Commerce, attended the meeting and stated that the department would co-operate with the Rubber Association in instituting an annual survey of dealers' stocks throughout the country. The survey will be made in two parts, one in November of each year to cover dealers' stocks of canvas rubber-soled footwear, and the other in March to cover all waterproof rubber footwear.

T. J. Needham, of the United States Rubber Company, was elected chairman of the Footwear Division for the current year, and M. R. Stevenson, of the Hood Rubber Company, was elected vice-chairman.

Dr. Zimmerli Speaks Before Los Angeles Rubber Group

SPEAKING before a well attended meeting of the members of the Los Angeles Group of the Rubber Division of the American Chemical Society on March 29, Dr. W. F. Zimmerli, of the Roessler & Hasslacher Chemical Company, New York City, discussed the topic of "What Is Vulcanization?" His talk was received with enthusiasm by the gathering and was followed by an interesting discussion.

"The subject of vulcanization," Dr. Zimmerli said in part, "is one which has caused all of us considerable concern at times. In our experiences we have found that the theories of vulcanization do not adequately explain what is taking place and it is necessary for us to review these experiences in order to determine whether a different conception of what vulcanization is would not assist us in making progress in rubber technology and in understanding our problems.

"While we are prone to place rubber in a category by itself it does have similar properties to other materials in the sense that iron and lead are similar. We accept the formation of jellies in different mixtures as a matter of fact; sometimes with pleasure because we want a jelly and other times with despair or disgust because we do not want it."

The properties of jelly, glue, gelatine, gums, paints, lacquers, and greases were discussed by the speaker and he pointed out that in a great many cases similar phenomena are met in rubber. In reviewing the properties of crude rubber, Dr. Zimmerli said, "We can conceive that this material may be a jell of two different types of hydrocarbons where probably the protein is also an important factor. The term 'plasticity' as generally used by the rubber manufacturer is really the character or quality of jell structure in the crude rubber. The different properties of the Caucho ball and the latex sprayed rubbers are examples of this difference in jell structure.

"It is possible to produce artificial jells in raw rubber which are similar to the livering of paints or the jelling of greases, and in fact very similar to the term which we call 'scorching.' Soaps and certain types of accelerators were mentioned in this case. The livering of rubber cements was mentioned as being very similar to the livering of paints.

"In reviewing our experiments on vulcanization we are led to realize from experience that the rubber sulfur reaction product is not sufficient to produce technical vulcanization. Sulfur will react with pure rubber to form a sulfur rubber reaction product in sufficient quantities to produce technical vulcanization when the proper other ingredients are present, but we would no more call this sulfur rubber reaction product a technical vulcanization than we would term reclaimed rubber which contains the sulfur rubber reaction product technical vulcanization.

"Our early experiences taught us that organic acids and bases of some sort are necessary. The acids present in the raw rubber were sufficient to produce vulcanization and the oxides: zinc, lead, magnesium and calcium were found to give added properties to the rubber.

"The properties of vulcanization containing zinc and magnesium oxides were compared with the properties of greases obtained with zinc and magnesium stearates. The fact that zinc oxide forms a salt in the rubber during vulcanization is indicated by the observation that when small amounts of zinc oxide are present this goes into solution in the rubber. The accelerators were developed to supply a deficiency in plantation rubber. At first these were basic in character but at the present time their constitution is heterogeneous. I do not believe that these function, as at first thought, merely as a catalyst in the rubber reaction. It would seem that they are more jellying agents, just as Certo is a jellying agent (or accelerator) for the jellying of currant jelly."

The phenomena of under cure and over cure and the action of age resisters were discussed in the light of this jell theory of the vulcanization of rubber.

Program of Rubber Division, A. C. S.

Columbus, O., Wednesday, May 1.

1. Thomas Midgley, Jr., and Albert L. Henne (Baker Laboratory, Cornell University). *The Effect of the Presence of Magnesium Oxide or Zinc Oxide on the Products of the Destructive Distillation of Natural Rubber.*
2. Harlan A. Depew (New Jersey Zinc Company). *The Influence of Pigments on Some of the Physical Properties of Unvulcanized Rubber.*
3. Ira Williams (Grasselli Chemical Company). *The Transformation of Energy by Rubber.*
4. Franz D. Abbott (Firestone Tire & Rubber Company). *The Testing of Automotive Rubber Parts Assembled Under Compression.*
5. C. W. Sanderson (Goodyear Tire & Rubber Company). *The Evaluation of Reclaim in Tread Stock.*
6. C. M. Carson. *Some Observations on Carbon Black.*
7. Philip M. Torrence and Leslie C. Peterson (India Tire & Rubber Company). *A New Flexing Machine for Rubber.*
8. Report of the Physical Testing Committee.
9. Business Meeting.
10. Subscription Dinner (6 P. M.).

Estimates *of* Rubber Production *and* Consumption

Early Predictions Deemed Too Conservative in View of Heavy American Consumption and Record Malayan Production

THE open season for shooting at speculative statistics on the probable consumption and production of crude rubber during 1929 has about closed and it is now time to check up on their possible correctness. Prognostications as to production have gone as low as 692,500 tons, made by H. Morison & Company, to as high as 769,000 tons by Chas. Hope & Son. Estimates of consumption, almost wholly optimistic in their large totals, have gone to the height of 730,500 tons as predicted by H. Morison & Company and to the conservative low figure of 680,000 tons from Lewis & Peat.

With three months of the current year now past it is timely to digest the present trends and readjust some of the speculations of these prophets.

A resume of the predictions made by the leading authorities in the crude rubber trade in London is given herewith. American authorities have not in general given voice to their views.

Predictions for 1929

	Consumption	*Production*
H. Morison & Co.	730,500	692,500
Rickinson	727,000	692,000
Lloyd, Mathieson & Carritt	701,500	701,000
Lewis & Peat	680,000	690,000
Chas. Hope & Son	709,000	769,000
Faulkner & Winsor	695,000	715,000
Lane Mitchell, Ltd.	710,000	685,000
Symington & Sinclair	723,000	726,000
Hymans Kraay	692,000	715,500
Wm. Jas. and Hy. Thompson	705,000	707,000
Average	707,300	709,300

THE RUBBER AGE makes bold to suggest that the most optimistic of these consumption and production figures are conservative in the light of the present activity in both the plantation and manufacturing industries.

The table on this page is in round figures the prediction of THE RUBBER AGE for the absorption and production of crude rubber during the present year in comparison to the latest actual statistics covering last year.

An analysis of these figures, by way of justification, of course, is in order. It can conservatively be assumed that crude rubber will average at least 22 cents in the market for the remainder of the year. At twenty cent rubber the plantation grower, whether efficiently organized or not, can make money. The native grower can also make an excellent return. Consequently it may be argued fairly that all available acreage will be tapped as long as consumption shows some relation to another high annual record.

Considering the accompanying estimates for consumption within the United States, the absorption by the manufacturing industry for the first quarter of the year not only represents a record in the history of the industry but would presume a total for the year, at the same quarterly rate, of 517,000 tons for the United States alone. Heretofore the advance in consumption yearly for the entire world has been set at 8 per cent, but 10 per cent nearer approximates the average increase, setting aside the lean years of which there were very few. This year with the impetus given during the first quarter, the rate of increase should at least be 12 per cent which would bring our predicted figure of world consumption of 756,000 tons well within conservative limits.

Aside from the United States, there is already reported an appreciable increase in manufacturing activities in the other countries. Germany is reported to be taking a large increased volume of crude rubber. Italy and Japan are also rising consumers. Great Britain will undoubtedly increase her consumption if for no other reason than the establishment last year in the United Kingdom of the American plants of Firestone, India Tire and Rubber,

Estimates of Consumption and Production of Crude Rubber in 1929

Consumption

Country	1928*	1929
U. S. A.	441,000	485,000
United Kingdom	48,000	55,000
Germany	40,000	45,000
France	40,000	43,000
Canada	31,000	35,000
Japan	25,000	28,000
Russia	7,000	10,000
Italy	12,000	14,000
Australia	9,000	12,000
Belgium	8,000	8,500
Austria-Hungary	3,500	4,000
Scandinavia	3,500	4,000
Spain	2,500	2,500
Other Countries	9,000	10,000
Total	679,500	756,000

**Estimated from latest returns.*

Production

Country	1928*	1929
British Malaya	229,652	385,000
Netherland East Indies	225,983	265,000
Ceylon	57,267	80,000
India	10,790	12,000
Sarawak (Malayan Imports from)	10,087	12,000
British North Borneo (Last quarter estimated)	6,505	8,000
Siam (Malayan imports from)	4,818	5,000
Indo-China	9,548	10,000
Brunei (Malayan imports from)	484	500
Philippine Islands	309	400
Papua, Samoa, and Fiji	738	750
Amazon Valley	21,129	25,000
Other America, except Guayuale	1,490	....
Guayule Rubber (United States imports)	3,076	....
Africa	6,124	7,000
Total	658,000	810,650

**Actual—From U. S. Dept. of Commerce (net exports—dry weight).*

Goodrich and Goodyear and the other foreign firms of Michelin and Pirelli. Local British plants are also reported to be increasing their consumption.

Australian consumption is expected to increase through the inauguration of the Rapson plant and the local Goodyear factory. Russia has a program of production which will take at least an additional 3,000 tons over the 1928 figure.

A phase of the present trend in rubber consumption which has not been fully appreciated has been very clearly brought out by the Department of Commerce, in connection with the decline in the ratio of reclaimed rubber consumed to crude rubber. They point out the fact that while for the years 1928 and 1927 the ratio was around 50 per cent, the first three months of the current year has shown a sharp decline to 43 per cent. Assuming that this loss represents the substitution of crude rubber and averaging this gain in crude rubber consumption over the year, it would mean that approximately 30,890 tons would be added to American consumption alone, taking the total consumption of 1928 as a basis.

As to the matter of production the estimated figure of 810,000 tons is not an improbable one. It is based largely on the increase expected from British Malaya and Ceylon since the removal of all restrictive measures, but also on the maturing holdings in the Dutch East Indies, which from private reports are believed to be far in excess of what the crude rubber trade has heretofore visualized.

Production in Malaya and Ceylon during 1928 does not lend itself as a fair basis for comparison with the potentialities of 1929. Estates varied their tapping programs, some beginning full tapping as soon as restriction was in sight and others working up to full capacity more slowly. It must also be noted that the latest basis for Standard Production was for tapping every third day and if Malaya had even been on an alternate day basis, 100% Standard Production for 1928 would have been in the neighborhood of 335,000 tons.

Malayan Production Exceeding All Estimates

But as the Department of Commerce has pointed out, the Malaya statistics for the eight months from June, 1928, to February, 1929, inclusive, indicate an even heavier production. The total for the eight months is 282,167 tons, representing an average monthly production of 35,271 tons or an annual rate of production of 423,250 tons. This is an extraordinarily high figure and will probably not be reached as the rainy season between March and June will bring the monthly average lower. Nevertheless the excellent condition of the rubber trees after so long a period of restricted tapping doubtless makes them abnormally productive now and there is every indication that production in recent months in Malaya has been at a rate considered impossible prior to last November.

While it was generally thought that the standard production of the individual estates in British Malaya was high and it was supposed that 60% standard production under the Stevenson Scheme was really 80% actual capacity of the specific estates, under the basis of tapping every third day, it is not improbable that the original 100% capacity is now a very conservative figure of what can actually be produced now, in view of new plantation methods instituted, new areas in bearing, "resting" areas, etc.

No student of the situation can be blind to the renewed activities in wild rubber in the Amazon basin. As a reaction to Ford's activities in that region an additional 5,000 tons can well be expected during the year. The present year's exports from that locality already shows an increase over last year. It is fair to assume that all other wild areas, particularly Africa, will increase their 1928 production, if for no other reason than the 22 cent price and the stimulated interest in the commodity. Nor will this apply solely to wild rubber. We have already predicted an advance in production in the Dutch East Indies to 265,000 tons. New Indian plantations will also be maturing.

Africa, stimulated by the increasing activities of Firestone in Liberia, will probably increase its production from native sources. The Firestone project incidentally, is reported to have cleared and planted upward of 40,000 acres and the small planted acreage originally acquired and already in bearing is expected to return an increased yield this year.

Rubber now occupies fourth place among the commodities exported from Siam and further increases are anticipated. Plantations in the Chantaboon area are reported to be unusually virile and healthy.

The Philippines can well be considered in the background for the present but small increased plantings were made in 1924-25 on the Basilan estates which should be maturing this year.

No Immediate Shortage Seen

Various predictions have been made since 1922 that a rubber famine would be imminent about 1928. Stocks at the end of last year were not high but it should be remembered that the effects of restriction were still limiting production and new areas planted since 1922, especially native holdings, were scarcely in bearing. In view of new areas opening up, Firestone's project, Ford's venture, and other new developments, it is hardly to be presumed that any crude rubber shortage can manifest itself for several more years.

The prediction of THE RUBBER AGE as shown in the accompanying table indicates a production (in excess of consumption) of approximately 54,000 tons which is not an excessive carry-over in any sense and would not represent more than one month's consumption. The outstanding feature of the statistical position of crude rubber today is the tendency toward something like an equilibrium between world production and consumption. A healthier state in relation to the industry as a whole could hardly be realized.

Therefore, taking into consideration the almost certain increase in world consumption and the maintenance of a fair market price for crude rubber, the increase in production in all areas is expected to equal the estimates shown in the accompanying tables.

XX Green Zinc Oxide

A NEW fine particle zinc oxide called "XX Green" has been introduced by the New Jersey Zinc Company, New York City. It was developed especially for use in rubber to fill a demand for a zinc oxide yielding high abrasive resistance and possessing the factory working qualities of the XX Red.

This new pigment, according to its manufacturers, has a uniform effect on the rate of cure and gives uniformly high reinforcing properties which are maintained by rigid manufacturing control and careful grading. It calenders and mills easily, producing a stock with a higher abrasion resistance than has heretofore been obtained with high zinc oxide compounds of comparable working properties.

"XX Green" zinc oxide has a fine particle size averaging about 0.20 μ compared with 0.35 μ for XX Red and 0.15 μ for Kadox. The reinforcing properties, abrasion resistance and rate of cure of "XX Green" are intermediate between XX Red and Kadox. Chemically, the new pigment is commercially lead-free, being similar to XX Red in this respect.

The manufacturers' suggested applications for XX Green is in solid tires, pneumatic treads, heavy duty tubes, carcass stocks and wherever a fine particle pigment with good working qualities, high abrasion resistance and high test conductivity is required.

Trends in Rubber Footwear STYLES *for 1930 Season*

Color and Dressiness Are Dominant Notes With Tendency to Create Attractive Ensembles—Cuff Gaiter Being Displaced By Light All-Rubber Gaiter

Above: Gutta-Percha's *"Speed Rainette"*
Below: Miller's *"Shuglov"*

AT a recent meeting of the footwear division of the Rubber Association, it was suggested that February 1st be made the date for the opening of the selling season on winter footwear instead of January 1 as has been the custom formerly. There is considerable merit in this suggestion which is well illustrated by the trend of the current season. January is too early for shoe buyers to place future business as they have not yet cleared their current stocks, especially if the season has been late as was the case this year. The manufacturer is also at a disadvantage especially on novelty lines as he has not had sufficient time to review the trend of style and consult with his customers to obtain their ideas on anything new he is developing.

In fact in recent years there has been an increasing tendency to delay the bringing out of novelty footwear until later in the season. Many companies have not as yet issued their advertising on new lines of this sort, but sufficient data is now available to enable us to discuss forward developments.

All Rubber Gaiter is Leading Type

Showings for the coming year already indicate that the low cuff gaiter which has had a big run for several seasons is being displaced by the all-rubber gaiter in two styles, the so-called snap fastener, and the slide fastener type. These gaiters employ the latest compounding skill of the chemists in development of beautiful colored stocks run in engraved moire patterns, and advance ideas in shoe designing which emphasize slim lines and perfect fit. Style and lightness in weight are the attractive features of these gaiters, and they are finding favor for spring and fall wear, displacing somewhat the old standard women's black croquet rubbers. Other developments along these lines are lightweight moire finish colored light rubbers, some in crepe designs with cross straps and buckles, imitating the fancy leather shoe oxfords and pumps. Imitation suedes have been developed by several manufacturers for use in this type of shoe. Colors have been carefully selected to conform to the latest colors in women's wear and hosiery for fall. Cocoa brown, beige, and blues predominate.

In sportswear, many refinements have been made in trouting and fishing boots, among them being the cleated sole to prevent slipping in the streams, and a new dead grass color to harmonize with hunting costumes. Other footwear lines in boots, lumbermen's heavy gaiters, and rubbers follow the lines of last season with only minor changes in lasts to fit the latest leather shoe models.

Beacon Falls Rubber Shoe Company, Beacon Falls, Conn., is again showing a complete line of footwear. The heavy goods line is featured by the addition of a new special deluxe line of boots under the name "Seaboot," made in both gum and duck varieties with knit wool and felt linings. Women's all rubber gaiters are featured with the "Neat-fit" line in tan, brown, and black colors, in both snap fastener and automatic types. "O' SO NEat" is a line of cuff snap gaiters, and fancy four buckles are offered under the name "Smartics."

Cambridge Rubber Company, Cambridge, Mass., originators of "Raynboots," the first cuff gaiter, is out with a well styled and balanced novelty line for the coming year. "Raynboots" are offered in three types, "Spat "Raynboots," "Hi-Back Raynboots," and "Strap Raynboots," with mocha browns, tans, black, seal brown, brown tweed, heather mixture, and gray colors. "Raynshus," which includes the line

Above: Hood's *"Midwate"*

Right: Hood's *"Shopper"*

Dominion *"Snapees"* Miner *"Juliet"* Goodyear *"Gold Seal Atlas"* Servus *"Step Out"*

of all rubber novelties, are made with the Talon fastener of the Hookless Fastener Company in brown, sand and brown and black; also in scallop pattern and four-snap pattern all with rubber cuffs. Four buckle gaiters are also carried in colors. The heavy goods line includes three grades of boots, Camco Super Quality red, Camco Quality black, and Stadium brand black; all rubber heavy gaiters under the name "Round-Ups"; a "Rodeo," 15 inch lace boot and other key numbers in cashmerette gaiters and artics, ribbed overs, heavy rubbers and light rubbers. "Raynettes" feature the light rubber line with a colonial pattern in sand and brown with moire rubber upper; and a pump pattern in oak and brown.

Sport Shoes Featured

Converse Rubber Company, Malden, Mass., is featuring the famous "Big C" line of quality feature with a differential line under the name "Liberty Brand" to assist its dealers in meeting price competition. A complete range of heavy and light sportsmen's specialties are offered in the new dead grass color, the "Flexlite," a new lightweight fishing boot; the "Rawhide" heavy boot; the "Buckskin" and "Seneca" in four and five buckle heavy all rubber gaiters; the "Nimrod," a canvas laced sport shoe; the "Lombard," a new grass color three buckle knee fishing boot; and the "Camden" in the lumbermen's over line. The "Caboose" work rubber for which Converse has been famous for many years has several new features, among them a white pebble reinforcing at the back and an extra thickness of the sole at the heel. In the novelty line Converse has the "Ensemble" in four colors with the Talon fastener, an all-rubber gaiter, and the "Milady," a two-snap all-rubber gaiter in gunmetal and tan with waterwave finish. The "Rio" is a new lightweight croquet rubber in tan and gunmetal.

The Firestone Footwear Company, Hudson, Mass., is out with a full line of footwear with many new features. A new manufacturing process has been developed which practically eliminates seams in rubber boots. Details of the new novelty line have not been issued, but it is safe to assume that Firestone will be in the forefront with novelties this year as they have been in the past with the "Ritz Imperial" gaiter.

Goodyear Rubber Company, Middletown, Conn., is featuring the staple numbers in heavy and light goods under the Gold Seal trademark "like the Sterling mark on silver," denoting super-quality rubber footwear. "No Tear" duck boots which have made this company famous for years, heavy gaiters and artics, lumbermen's specialties, and heavy and light rubbers comprise the line under the new policy. The "Atlas," a half storm work rubber is featured with a new patented exclusive feature, the U-wear heel.

Brown is Dominate Color

Hood Rubber Company's line for the coming year emphasizes its usual completeness with a smartly styled array of galoshes. The line has been designed and styled on three fundamental principles (1) neatness, trimness, perfect fit; (2) harmonizing color range; (3) ease and simplicity of operation. They introduce a new galosh style which is inconspicuous and less ornamental, one which emphasizes the natural slimness and attractiveness of the ankle. Varying shades of brown predominate with the neutral, steel gray, gunmetal, heather mixture, blue and conventional black colors. The "Ardmore" is a high grade cuff gaiter with rayon and wool material in pleasing color combinations; the "Shopper" is a new vogue of two snap cloth cuff gaiter which eliminates the gaping, jawing, and unsightly clumsiness of former types. The "Society" is a new number in the featherweight group in rayon and cotton material, two snap construction, whereas the "Featherwate" covers a three snap construction in the same group. For those who desire height and protection there is the "Tally Ho" in two snap overlapping construction; and the "Midwate" with three snaps in tweed fabrics. Cuffs match the fabrics this year as contrasted to the velvet cuffs of former years, and soles and foxings closely harmonize. In the now more or less conventional cuff gaiters, Hood offers the "Mode" and the "Carnival" and the "Vogue" in the lower priced field. "Tremont" and "Princess" emphasize the high and low automatic fastener line, with "Spanish" the key number of four buckles, now featuring feather-stitched edges. In the all-rubber line there is the "Rubalosh," of three snap construction, in gunmetal, gabardine, tan and brown.

U. S. Rubber *"Gotham Gaytee"* Kaufman *"Delight"* and *"Genoa"*

La Crosse Rubber Mills Company, La Crosse, Wisconsin, one of the large western producers, is out with a complete line of stample numbers in "Star," "La Crosse," "Wisconsin," and "Badger brands. In the new line of novelty gaiters and autogaloshes they have designed a

number of desirable and modish models and have provided exclusive fabrics to entice the consumer in search of the most fastidious. To afford a reasonably wide selection without resort to loud and ridiculous fabrics and patterns has been their aim. They have a particularly pleasing line of women's all rubber gaiters made both with automatic and snap fasteners in pleasing two-tone effects. The gum-shoe line is featured by "Flexo" lightweights which fit a wide range of leather shoes with few styles.

The Miller Rubber Company, Akron, Ohio, has broadened its line of "Shuglovs" with many new attractive types. Features of these shoes are their glovelike fit, featherweight lightness, Talon hookless fasteners, the splashguard cuff, wing toe tip which gives a slenderizing effect at the toe, and a smart heel effect. Cloth gaiters have been added, tailored of Stenton cloth, the elastic all-woolen texture that is built into the smart overcoatings for women. The "Volga" boot is a new all-rubber number 16 inches in height with a Talon fastener, so constructed that the top may be worn turned down to cuff effect. Miller has accomplished a good standardization feature with this line which, owing to its flexible construction, has enabled them to eliminate half sizes and widths; four colors only are carried, thus the merchant is assured of a quick turnover.

Many New Novelty Lines Offered

Servus Rubber Company, Rock Island, Ill., is keeping pace with the other companies with a new and more extensive line of footwear. Key numbers of staples are the "Allservus" red boot, the "Servwel" all rubber gaiter, the "Illini" cashmerette four buckle, the "Allservus" over, and "Mudguard" rubber. The new novelty line features "Step-Out" gaiters, a line of all rubber novelties with two snaps and an adjustable buckle, and the "Payree" gaiter of similar type with cloth upper. "Step-outs" are made in moire finish in black and gray, all black, and brown and tan, while "Payrees" are made in black and white, heather, black, and pepper pattern. The "Avenue" gaiter shows some refinements over the conventional cuff gaiter, and the "Gum-Vamp" gaiter is a four buckle built especially for children with a cloth quarter and all rubber vamp.

The Tyer Rubber Company, Andover, Mass., is concentrating its efforts for the coming year on staple numbers in heavy goods. Its line of boots, pacs, lumbermen's overs, all rubber and cashmerette heavy gaiters is very complete. All heavy goods are pressure cured, while the light gum shoes are made by the hot press method, welding upper and lining together thoroughly.

Canadians Following American Styles

Canadian rubber footwear manufacturers follow American styles to some extent in their new lines, although many types are carried in Canada which are distinctly their own. This is a natural condition, as the United States Rubber Company operates the Dominion Rubber Company, Ltd., and Goodrich also has a Canadian factory. Thus in the line of Dominion Rubber footwear featuring "Gaytees" and "Blue Bar" footwear, one finds a counterpart of the United States line to some extent with additional features. Among the new "Gaytee" numbers are the "Stylo" with adjustable cuff to be worn in various attractive ways; the "Coupe," a brown and black velvet, fur trimmed carriage boot; "So-Lite," four dome all rubber gaiters; and Jiffy "So-Lite," made with Jiffy automatic fasteners. "Snapees" are the newest creation in women's light novelty rubbers. A special men's clog rubber especially designed to wear with spats is a distinctive Canadian number.

The Gutta Percha and Rubber Company, Ltd., of Toronto, Canada, features many new specialties, the "Riverdale," made in Wellington boot style, with colored moire finish to match raincoats. This type of boot is widely sold in Canada and abroad, but not in America. "Durettes" are a continuation from last season, being a cuff gaiter with a high back, and are now offered in satin fabric. "Rainettes" are similar to the American four snap all rubber gaiter except that they have the high back effect. Smart ultra footwear protection is offered with the "Pierette," created from suede velvet and check satin in tobacco brown and black with harmonizing Belgian Coney fur trimming.

Miner Rubber Company, Granby, Quebec, makes a full line of heavy and light footwear, also clothing. Novelties are featured under the name "Shu-ettes" covering the snap, automatic, and cuff and buckles types, with the fur-trimmed Canadian feature added on some numbers.

The United States Rubber Company are again concentrating on their "Gaytees," matching the ensemble in a wide range of color values rather than bringing out any thing new in type or pattern. The Kaufman Rubber Company's "Life-Buoy" line shows a few additions in heavy footwear. Catalogs of these two companies did not arrive in time to make a more complete description of their respective lines.

The new season's catalogs have not been received at this writing from B. F. Goodrich Company, Mishawaka Rubber & Woolen Manufacturing Company, Mishawaka, Ind.; and Phillips-Baker Rubber Company, Providence, R. I. It is understood that all these companies have added new items to their line which will probably follow in general the new designs in style and construction as indicated by the trends in other companies lines.

Fewer Duplicate Styles

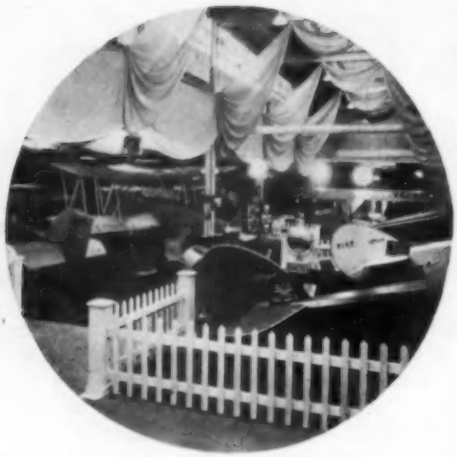
Analysis of the line for the coming year as a whole indicates that the manufacturers have learned many valuable lessons from their experience of the past two winters. Novelty lines are more correctly styled and held within reasonable bounds without too great duplicity of styles. The new price schedule, more accurate control of output which will be afforded by the monthly statistics of the Rubber Association of production, sales, and inventories of footwear, and the annual survey of the Department of Commerce of dealer's stocks of footwear, should lay the groundwork for more stable conditions than have existed in the rubber footwear industry for some time.

Ureka—A New Accelerator

UNDER the name of Ureka, the Rubber Service Laboratories Company, Akron, O., has introduced a new accelerator invented in their own research laboratories and manufactured and sold exclusively by them. The material is a new type delayed action accelerator in that it requires a certain amount of time at a given temperature before the material becomes active as an accelerator. This delayed action permits handling of faster curing stocks on the mills, calenders and tube machines without scorching difficulties. Its advantages over the usual delayed action accelerator are that it has a considerably wider curing range.

The manufacturer claims to have found it satisfactory for use in all types of stocks, such as tires, tubes, shoes, mechanical goods and drug sundries. Its curing range is from 20 to 60 pounds of steam so that it works well in practically all types of stocks. It will turn the stocks slightly yellow and, therefore, cannot be used in white stocks. However, it is satisfactory for all colored stocks.

For use in tires it gives excellent cures, according to the manufacturer, together with satisfactory aging and good abrasive figures. One of its outstanding advantages for use in tread stocks is that it does not require high amounts of stearic acid to activate it. The manufacturer does not recommend omitting all the stearic acid in a formula, as a small amount, such as one per cent on the rubber, is very beneficial in keeping uniform cures.



Progress in Aviation Extends Market for RUBBER PRODUCTS

Leading Tire Companies Have Exhibits at All-American Aircraft Show in Detroit

THE second All-American Aircraft Show, held at Convention Hall in Detroit, Mich., from April 8 to 13, proved to be one of the most remarkable expositions of the aviation industry ever conducted, thousands of visitors filling the hall daily to see the mammoth exhibition of 104 types of planes and every kind of aeronautical accessory. Tire and rubber companies were well represented with attractive displays and contracted for considerable business during the period of the show.

In charge of the aircraft accessory display of the Goodyear Tire & Rubber Company were Hugh Allen, Herbert Maxson and Frank Petrie of the publicity department, and Larry Guinther of the aeronautics sales department. Not only were airplane tires shown, but there were exhibits of airplane tubes, streamline pontoon hand hole covers, shock absorber discs, shock absorber tubing, airplane matting, aircraft radiator and gasoline hose, rubberized fabrics, rubber tank covers, rubber couplings, pneumatic rubber cushion seats and special moulded goods, such as rubber grommets and handle grips.

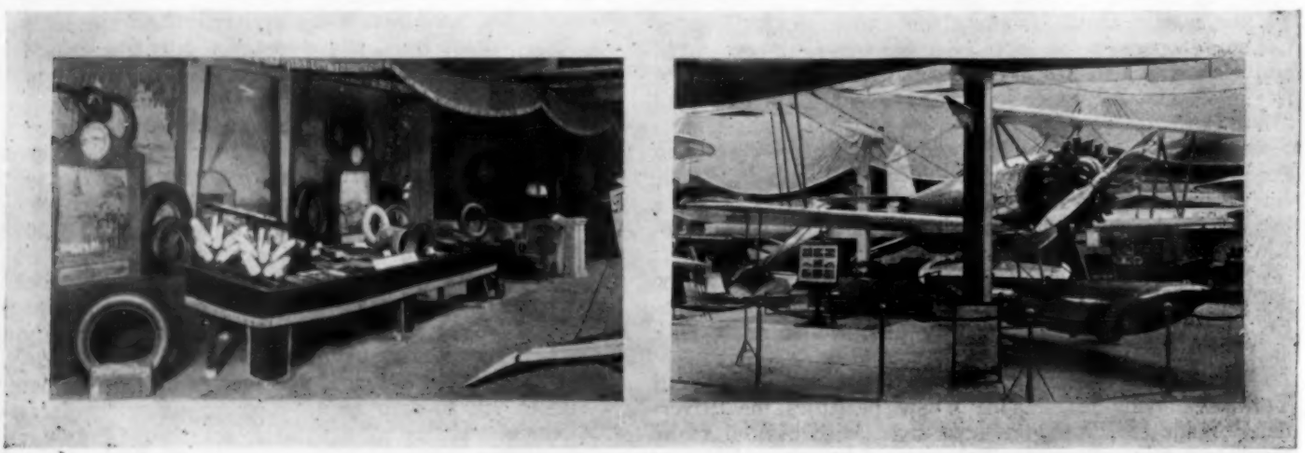
The Goodyear organization announced that it is now establishing airport service stations at many airports throughout the country where airplane tires and other equipment are available. In some cases, new dealers are being established, and in other cases, present dealers are enlarging their service to include aircraft material.

Thomas A. Aspell, assistant manager of the manufacturers' sales department, and Henry Wacker of the same department of the B. F. Goodrich Company, J. A. Reed of the Goodrich company's New York office, and K. D. Smith, superintendent of construction and design for Goodrich, represented that company at the exhibition. The Goodrich Fairchild plane, "Silvertown," was flown to Detroit by the company's new pilot, Lee Schoenhair, who recently succeeded "Cy" Caldwell, and the ship remained there for the week of the show. The B. F. Goodrich Company in the week following the show elected C. M. Keys, president of the Curtiss Aeroplane and Motor Company, to its board of directors.

The Firestone Tire & Rubber Company was represented by Roger Taylor and by C. C. Sisler and W. E. Wilson of the manufacturers' sales department, together with Robert F. Milar of the advertising department who arrived later in the week. The Firestone company had a large display at the show in Convention Hall and another at the company's branch office, only a block away from the exposition.

The United States Rubber Company used an aviation background for its two large display booths. The central portion of this exhibit was devoted to factory processes, showing completely the transition from raw materials to the finished tire. The various patented manufacturing processes used by the United States Rubber Company were featured, including latex, web cord, sprayed rubber and flat band building. Mechanical rubber items applicable to the aeronautical industry were also exhibited, including products of the company's wire division. A continuous motion picture was also used, showing scenes from the company's rubber plantations in the Far East. Joseph A. Faucher, manager of airplane tire sales, was in charge of the exhibit during show week.

The General Tire & Rubber Company also showed its line of airplane casings, tubes and other equipment in an attractive display. The Packard Electric Company, Warren, O., exhibited a variety of rubber insulated cables for airplane ignition systems. Other rubber companies were also represented by displays and by staff members.



The Exhibit of the United States Rubber Company and a General View of the Detroit Aviation Show

RUBBER CHEMISTRY and Technology

The Oxidation of Vulcanized Rubber*

By A. van Rossem and P. Dekker

SINCE Kirchhof[1] in June, 1927, gave to the first general meeting of the German Rubber Society in Essen a detailed review of work concerned with the oxidation of rubber, it seems superfluous to publish any extensive bibliography thereon. We prefer to limit ourselves, for the present, almost exclusively to a few experiments in this field. However, we may refer in a general way to the work of others.

It is a notable fact that all investigations of the oxidation of vulcanized rubber have been always based on the kinetics of the oxygen combination, and, as far as isolation of the oxidation products is concerned, on a late stage of oxidation, the isolation of oxidation products during the early stages of oxidation being left out of consideration.

Thus, for example, Kirchhof[2] in his work published in 1913 studied the behavior of ground vulcanized rubber which had been heated for 100 hours in a current of air at 100° C. and thereby strongly oxidized, as indicated by the increase in weight (11-13%).

Eaton and Day[3] later in 1919 made experiments of a similar nature. Here, too, the kinetics principally were studied, and the samples were examined only after oxidation was far advanced. Again in Kirchhof's recent work already mentioned, the oxidation products were studied only after prolonged oxidation.

Although, from a purely scientific standpoint, an examination of badly oxidized rubber is thoroughly defensible, yet, on the other hand, it may be rightly said that the further oxidation has progressed, the more complicated becomes the mixture of decomposition products and the smaller the hope of explaining the mechanism of oxidation. From a technical standpoint the analysis of oxidation products at a rather late stage of oxidation appears aimless. If one can perceive by appearance and smell that the rubber is oxidized, then it has long since lost its interest for industry.

What does interest the manufacturer of rubber articles, the rubber chemist, the tradesman, and the consumer especially are questions concerning the initial stage of oxidation, as for example: Has the rubber reached the first stage of oxidation, or perhaps what is more important, how can one determine whether the rubber will soon begin to oxidize.

From the work of Marzetti[4] we know that the aging of rubber and the associated changes in mechanical properties, which are of the greatest importance in manufacture, are due for the most part to an oxidation process, which at first is very small, not exceeding one per cent increase in weight, but which nevertheless has a very important effect on the mechanical properties.

Now there is one phase of rubber research which especially has to do with the changes in physical properties during the initial stages of oxidation, namely, the Geer-Evans accelerated aging test or the Bierer-Davis bomb test, which is rapidly becoming popular. However, we do not intend just now to follow the oxidation of rubber in its initial stages by means of these more mechanical tests; as we have said we wish to consider the oxidation of vulcanized rubber from the chemical analytical side. Hence we shall devote our attention especially to the importance of the alcoholic potash extract of vulcanized rubber.

Preliminary Examination of the Alcoholic Potash Extract of Vulcanized Rubber

It has long been known that the alcoholic potash extract after previous extraction with acetone affords a method for determining the quantity of factice in simple rubber compounds. It is also known that in the presence of mineral rubber, asphalt, etc., the method is very unreliable, as these substances unless previously extracted with chloroform are found in part in the alcoholic potash extract. Finally it was known that in the case of oxidized rubber articles a portion of the oxidation products is soluble in alcoholic potash and therefore is included in the extract on analysis.[5]

It seemed advisable to proceed systematically and obtain some insight into the relationship between the amount of alcoholic potash extract and the degree of oxidation at various stages of vulcanization. For this purpose the simplest possible mixture was chosen, namely, 92.5 parts rubber and 7.5 parts sulfur. This compound was given a series of cures in an autoclave at 3.5 atmospheres or 147° C. The finely ground samples were analyzed and aged in open dishes in diffused light. After 1 and 2 weeks, and 2, 4, 8, 12, and 18 months the analyses were repeated.

The following determinations were made:

a. **Acetone extract,**
b. **Free sulfur,**
c. **Combined sulfur,**
d. **Alcoholic-potash extract.**

At the time these experiments were begun, that is, about six years ago, the potash extract determination was made in the following way: 2 g. of rubber previously extracted with acetone were covered with 20 cc. of benzene and allowed to swell over night. The next day it was heated with 40 cc. of O.5*N* alcoholic potash for four hours on the steam bath under a reflux condenser, filtered, and washed a few times with boiling alcohol and water. The filtrate together with the wash water was evaporated almost to dryness (3 to 5 cc.) The residue was taken up in about 100 cc. of water, and after acidifying with hydrochloric acid was shaken up with ether in a separatory funnel. The ether extract was evaporated and dried at 100° C. to constant weight.

e. Preliminary qualitative examination of oxidation products in the alcoholic potash extract.

The alcoholic potash extract consists of some possible oxidation products of the rubber and also some fatty acids, obtained from esters insoluble in acetone which are saponified by the alcoholic potash and which on subsequent acidification are found in the ether extract as fatty acids, as shown by the authors in 1926.[6] Dekker noticed in an analysis of rubber insulation containing factice that a more or less coherent film, consisting apparently of oxidation products of the rubber, remained behind if the alcoholic potash extract was heated after drying with more alcoholic potash, whereupon the factice acids dissolved, passing over to soluble soaps. The extract was therefore heated with 20 cc. of O.5*N* alcoholic potash for one hour on the steam bath under a reflux condenser, and then the liquid was poured off. At first the quantity of insoluble constituents remaining behind was judged only qualitatively.

f. Aqueous extract.

The aqueous extract was also determined because Eaton and Day[7] have noticed that vulcanized rubber when badly oxidized has a considerable quantity of aqueous extract.

From the mass of experimental data we have taken two series of experiments (Table I), which are based on vulcanized rubber containing 4.2% and 5.9% combined sulfur.

From these figures the important fact is evident that the alcoholic potash extract during the initial stages of oxidation is a much more sensitive quantitative measure of oxidation than the other values. The organic acetone extract at first remains absolutely

**Translated from Kautschuk, Vol. 5, No. 1, pages 13-21, January, 1929, by J. P. Fahy. Because of the length of the article, the conclusion will be published in* The Rubber Age *of May 10, 1929.*

Table I

CHEMICAL CHANGES OF VULCANIZED RUBBER ON AGING

Time	Increase in weight	Organic acetone extract	Alcoholic potash extract	Oxidation products	Aqueous extract
4.2% combined sulfur					
Before aging	.....	3.0%	0.8%	.....	0.2%
After 1 week	0.08%	3.0%	0.8%	x	0.2%
" 2 weeks	0.10%	2.8%	0.9%	x	0.2%
" 1 month	0.13%	2.8%	1.0%	x	0.2%
" 2 months	0.13%	2.9%	1.0%	x	0.3%
" 4 "	0.42%	2.8%	1.4%	xx	0.2%
" 8 "	0.50%	2.9%	2.8%	xxx	0.2%
" 12 "	0.70%	3.7%	2.4%?	xxx	0.3%
" 18 "	1.60%	4.7%	5.2%	xxxx	0.6%
5.9% combined sulfur					
Before aging	.....	2.7%	1.3%	.....	0.2%
After 1 week	0.07%	2.6%	1.5%	x	0.2%
" 2 weeks	0.13%	2.6%	1.7%	xx	0.2%
" 1 month	0.27%	2.5%	1.5%		0.2%
" 2 months	0.42%	2.8%	3.4%	xxx	0.3%
" 4 "	2.1%	5.6%	7.6%	xxxx	0.4%
" 8 "	17.6%	31.6%	9.2%	xxxx	5.9%
" 12 "	20.3%	44.4%	*		12.5%
" 18 "	24.5%	42.8%	*		17.0%

*The alcoholic potash extract cannot be determined because of the large amount insoluble in ether.

constant, while the alcoholic potash extract increases slowly but much faster than the increase in weight due to absorption of oxygen. In the case of a combined sulfur content of 4.2%, the aqueous extract increases only after 18 months, while in the case of 5.9% combined sulfur a considerable quantity of aqueous extract is obtained but only when the acetone extract itself has greatly increased. In these series the oxidation products in the alcoholic potash extract are given only approximately as 1 to 4 x. However, an increase in the quantity is evident.

As the oxidation becomes more advanced, a portion of the alcoholic potash extract becomes insoluble in ether after acidification, so that the quantitative determination of the alcoholic potash extract no longer has any value.

Procedure

In continuing this work the oxidation products were determined quantitatively. After heating the alcoholic potash extract with 20 cc. of 0.5*N* alcoholic potash, the insoluble products, which for the most part clung as a film to the bottom of the flask, were washed into a Gooch crucible and dried at 100° C. to constant weight. If the film stuck to the bottom of the flask, it was allowed to stand for some time under water or warmed for a short time on the steam bath. The film then separated quantitatively from the bottom of the flask and could be transferred to a Gooch crucible.

Experiments were now begun to determine the influence of the method on the quantitative estimation of the alcoholic potash extract and the oxidation products. A compound of 92.5 parts rubber and 7.5 parts sulfur was given a series of cures and allowed to age naturally for six months. After this period the determination of the alcoholic potash extract and the oxidation products was carried out according to various methods.

Table II contains the experimental data for three methods A, B, and C.

These results show that:

1. Previous swelling in benzene is quite essential.
2. The most favorable benzene-alcohol ratio is not 20:40 but 50:50. Further experimental data show:

Table II

INFLUENCE OF THE METHOD OF ANALYSIS ON THE QUANTITATIVE DETERMINATION OF THE ALCOHOLIC POTASH EXTRACT AND OXIDATION PRODUCTS.

Compound: Rubber 92.5 parts
Sulfur 7.5 parts

Vulcanized with increasing time of cure and aged six months.

		Combined sulfur			
		1.8%	4.3%	6.0%	7.0%
A) No swelling in benzene, 2 g. rubber+40 cc. 0.5*N* alcoholic potash	Alc. pot. ext.	0.1%	0.2%	0.6%	1.7%
	Oxidation prod.	0.0%	0.0%	0.1%	0.4%
B) 2 g. rubber+20 cc. benzene+40 cc. 0.5*N* alcoholic potash	Alc. pot. ext.	0.5%	0.8%	1.1%	3.5%
	Oxidation prod.	tr.	tr.	0.5%	2.4%
C) 5 g. rubber+50 cc. benzene+50 cc. 0.5*N* alcoholic potash	Alc. pot. ext.	0.8%	1.0%	2.3%	7.2%
	Oxidation prod.	0.2%	0.4%	1.5%	6.2%

3. If, in place of alcoholic potash, the rubber is swollen in benzene and then heated with alcohol, the oxidation products are dissolved and may be determined by the usual methods.

It is also evident that the saponification with alkali is not essential, but only the swelling in benzene followed by heating with alcohol. At the beginning of oxidation, oxidation products are formed from vulcanized rubber, which are insoluble in acetone but soluble in benzene. The dissolved oxidation products are extracted by the subsequent heating with alcohol. They dissolve better in a 50:50 benzene-alcohol mixture than in a 20:40 mixture. They are also soluble in ether. On further oxidation, oxidation products are formed which are soluble in benzene-alcohol but insoluble in ether.

4. Extraction with chloroform directly after extraction with acetone, as prescribed in the German methods of analysis, has but little effect on the result of the determination of the oxidation products.

5. The temperature of drying the alcoholic-potash extract or the oxidation products has little influence on the results as is shown by Table III.

Table III

INFLUENCE OF DRYING TEMPERATURE.

Compound: rubber 92.5 parts
sulfur 7.5 parts
Combined sulfur 5.4%

Drying temperature		Quantity found	
Alcoholic potash extract	Oxidation products	Alcoholic potash extract	Oxidation products
105° C.	105° C.	1.2%	0.7%
105° C.	20° C.	1.2%	0.7%
20° C.	105° C.	1.2%	0.7%
20° C.	20° C.	1.2%	0.7%

Systematic Investigation of the Increase in Oxidation Products on Aging and During Vulcanization

It was of great interest to follow the increase in oxidation products systematically: (a) on aging vulcanized rubber, and therefore during the oxidation of the rubber, and (b) during vulcanization.

(a) on aging vulcanized rubber.

A mixture of 92.5 parts F. L. sheets and 7.5 parts sulfur was given a series of cures. After vulcanization the combined sulfur, acetone extract, alcoholic potash extract, and oxidation products were determined. The vulcanized rubber was ground as fine as possible and exposed in glass vessels to diffuse sunlight. After 8, 15, and 24 months the analyses were repeated. The results are given in Table IV. Figure 1 shows some of the results graphically.

Table IV

INCREASE OF ALCOHOLIC POTASH EXTRACT AND OXIDATION PRODUCTS ON AGING.

Compound: F. L. Sheet 92.5 parts
Sulfur 7.5 parts

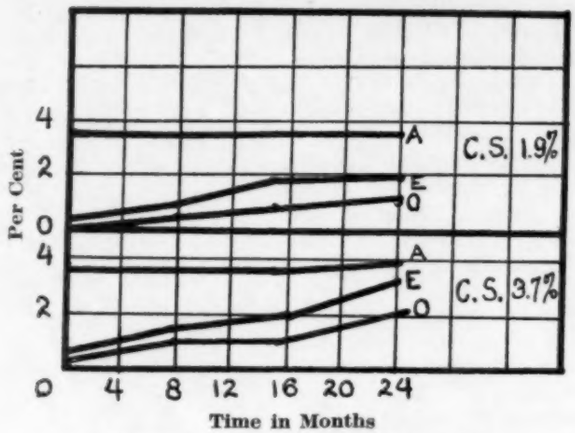
	Organic Acetone Extract	Alcoholic potash Extract	Oxidation Products in alcoholic potash extract
Combined sulfur 1.9%			
Immediately after vulcanization	3.7%	0.6%	0.1%
After 8 months	3.3%	1.0%	0.5%
" 15 "	3.4%	1.9%	0.8%
" 24 "	3.6%	2.0%	1.3%
Combined sulfur 3.7%			
Immediately after vulcanization	3.6%	0.8%	0.2%
After 8 months	3.3%	1.6%	1.1%
" 15 "	3.5%	1.9%	1.1%
" 24 "	4.0%	3.3%	2.2%
Combined sulfur 5.5%			
Immediately after vulcanization	3.4%	0.9%	0.3%
After 8 months	4.0%	3.1%	2.2%
" 15 "	7.9%	(4.0%)*	?
" 24 "	22.5%	(12.4%)*	?
Combined sulfur 6.7%			
Immediately after vulcanization	3.6%	1.2%	0.5%
After 8 months	9.1%	(5.7%)*	?
" 15 "	26.2%	(10.8%)*	?
" 24 "	45.4%	(2.0%)*	?

*A portion of the alcoholic potash extract is insoluble in ether.

These results show that:

1. The percentage of oxidation products increases on aging, and the faster the higher the percentage of combined sulfur.
2. At the beginning of oxidation the alcoholic potash extract and

Fig. 1
Increase in the alcoholic potash extract and oxidation products on aging.



Time in Months

Compound: F. L. Sheets 92.5 parts
Sulfur 7.5 parts
Combined sulfur 1.9 and 3.7%
A=Acetone Extract
E=Alcoholic Potash Extract
O=Oxidation Products

the oxidation products which it contains show a marked increase, while the acetone extract as yet shows no increase. The determination of the oxidation products is therefore a more sensitive method of demonstrating incipient oxidation than the acetone extract alone. 3. If the sample is further oxidized, a portion of the alcoholic potash extract becomes insoluble in ether, the figures obtained have no value, and the oxidation products can no longer be determined accurately by the usual methods.

Further experiments were carried out with numerous mixtures of different composition. Table V gives the values obtained for a compound consisting of F. L. sheets 92.5 parts, sulfur 7.5 parts, and zinc oxide 10 parts. A series of cures was run, and the compound finely ground before aging. Figure 2 is a graphic representation of the results. The observations made in the case of the rubber-sulfur compound hold true here also. (See Table IV.)

Table V

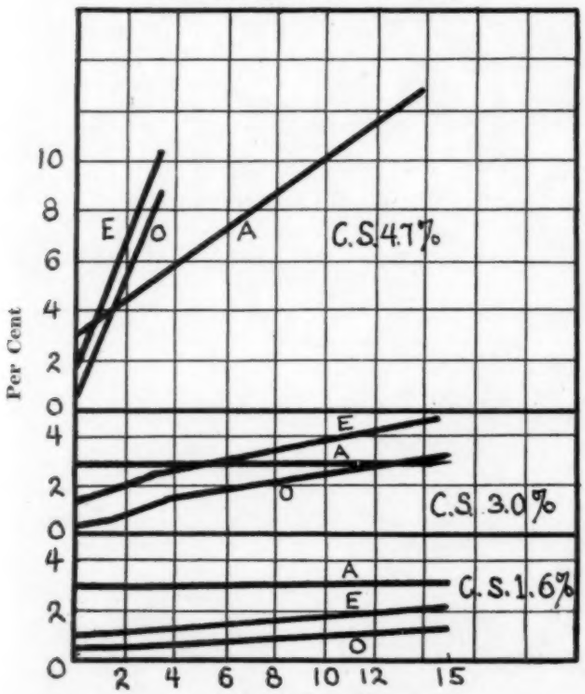
INCREASE OF ALCOHOLIC POTASH EXTRACT AND OXIDATION PRODUCTS ON AGING.

Compound: F. L. Sheet 92.5 parts
Sulfur 7.5 parts
Zinc oxide 10 parts

	Organic acetone extract	Alcoholic potash extract: Ether soluble	Alcoholic potash extract: Ether insoluble	Oxidation products in alc. potash extract
Combined sulfur 1.6%				
At first	3.0%	1.1%	.....	0.5%
After 1 1/3 months	3.2%	1.1%	.....	0.4%
" 3 1/3 "	2.9%	1.1%	.....	0.5%
" 15 "	3.3%	2.2%	.....	2.7%
" 24 "	3.6%	3.9%	.....	2.7%
Combined sulfur 3.0%				
At first	3.0%	1.5%	.....	0.7%
After 1 1/3 months	3.0%	1.9%	.....	0.8%
" 3 1/3 "	2.7%	1.4%	.....	0.5%
" 15 "	3.0%	4.9%	.....	3.4%
" 24 "	7.8%	9.6%	trace	8.1%
Combined sulfur 4.7%				
At first	2.9%	1.8%	.....	0.9%
After 1 1/3 months	4.2%	5.1%	.....	3.9%
" 3 1/3 "	5.2%	10.4%	.....	8.8%
" 15 "	14.4%	(11.4%)	28.0%	(7.5%)
" 24 "	26.4%	(13.0%)	50.0%	(10.8%)

(b) Attention was now directed to the changes in the alcoholic potash extract and oxidation products during vulcanization. A compound consisting of 92.5 parts F. L. sheets and 7.5 parts sulfur was given a series of cures at 147° C. and then analyzed. The same rubber was previously extracted with cold acetone, compounded as before, given a series of cures, and then analyzed. It is well known that extracted rubber oxidizes much faster after vulcanization, and

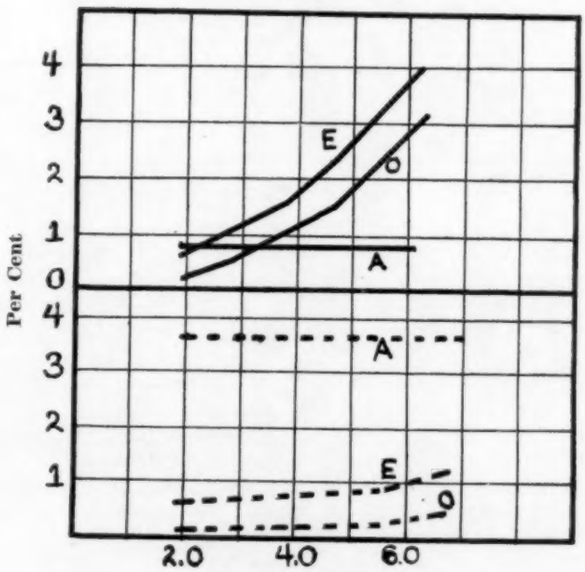
Fig. 3
Increase in the alcoholic potash extract and oxidation products on aging.



Time in Months

Compound: F. L. Sheets 92.5 parts
Sulfur 7.5 parts
Zinc Oxide 10 parts
Combined sulfur 1.6%, 3.0% and 4.7%
A=Acetone Extract
E=Alcoholic Potash Extract
O=Oxidation Products

Fig. 3
Increase in the alcoholic potash extract and oxidation products with increasing degree of vulcanization.



Combined Sulfur

-----Compound: F. L. Sheets 92.5 parts
Sulfur 7.5 parts
———Compound: Rubber as above extracted with
Acetone 92.5 parts
Sulfur 7.5 parts
A=Acetone Extract
E=Alcoholic Potash Extract
O=Oxidation Products

it was interesting to see if this would be indicated in an increase in the amount of oxidation products even during vulcanization. The results are given in Table VI and figure 3.

Table VI

RELATIONSHIP BETWEEN THE ALCOHOLIC POTASH EXTRACT, THE OXIDATION PRODUCTS AND THE DEGREE OF VULCANIZATION.

Compound: F. L. sheets 92.5 parts
sulfur 7.5 parts

Combined sulfur	Organic acetone extract	Alcoholic potash extract	Oxidation products
1.9%	3.7%	0.6%	0.1%
3.7%	3.6%	0.8%	0.2%
5.5%	3.4%	0.9%	0.3%
6.7%	3.6%	1.2%	0.5%
Compound: F. L. sheets extracted with cold acetone 92.5 parts; sulfur 7.5 parts			
1.9%	0.8%	0.6%	0.2%
2.8%	0.5%	0.9%	0.5%
3.8%	0.6%	1.6%	1.1%
4.7%	0.7%	2.3%	1.5%
6.1%	0.8%	3.8%	2.9%

It is evident that the content of oxidation products increases with the degree of vulcanization, slowly in the case of unextracted rubber and rapidly in the case of extracted rubber, whereas the organic acetone extract remains constant. To this we may add the important fact that:

The proportion of oxidation products in the alcoholic potash extract increases considerably at the beginning of oxidation, whereas the acetone extract remains constant.[8]

(TO BE CONCLUDED)

Notes

[1]*Kautschuk* **3**, 239, 256 (1927).
[2]*Kolloid-Z* **13**, 49 (1913).
[3]*J. Soc. Chem. Ind.* **38**, 339T (1919).
[4]*Giorn. chim. ind. applicata*, **5**, 122 (1923); RUBBER AGE (New York) **13**, 433 (1923).
[5]Kirchhof, *Kolloid-Z* **13**, 49 (1913).
[6]*Ind. Eng. Chem.* **18**, 1152 (1926).
[7]*Loc. cit.*
[8]It may be remarked in passing that in the presence of certain heavy metal compounds even the unextracted rubber-sulfur compound shows an increase in the oxidation products during vulcanization.

Elastic Belting Census

ACCORDING to the data collected at the biennial census of manufactures taken in 1928 by the Department of Commerce the establishments engaged in the manufacture of elastic belting in 1927 reported products valued at $22,829,800 as compared with $24,306,597 in 1925, the date of the previous census. This represented a loss of 6.1 per cent.

Balloon Casings Reach New Peak

PRODUCTION of balloon casings during February reached a total of 5,062,213, a new record for a single month's output in the United States, according to figures compiled by the Rubber Association of America, Inc. With shipments smaller than in January, inventories rose to a new peak of 9,963,456 for balloon casings and 15,494,613 for casings of all types. Inventories of balloon inner tubes also reached a new high.

The figures for February, as released by the Rubber Association of America, Inc., represent 75 per cent of the total industry in the United States and have been brought up to represent 100 per cent in the following table:

TIRE AND TUBE PRODUCTION
(All Figures Represent Thousands)

	January, 1929			February, 1929		
Pneumatic Casings:	Prod.	Ship.	Invent.	Prod.	Ship.	Invent.
All types	6,722	6,626	13,712	6,912	5,282	15,495
Balloon	4,627	4,665	8,779	5,062	3,969	9,963
High Pressure Cord	2,085	1,948	4,868	1,832	1,299	5,432
High Pressure Fabric	10	13	65	18	15	100
Solid & Cushion Tires	43	45	201	40	43	196
Inner Tubes:						
All types	6,517	7,242	15,386	6,769	5,278	16,999
Balloon	4,464	4,841	9,073	4,900	3,878	10,096
High Pressure	2,054	2,401	6,313	1,864	1,395	6,879

Bardol—Softener and Dispersing Oil

A NEW dispersing oil and softener developed in the Rubber Research Laboratory of The Barrett Company, 40 Rector Street, New York City, is being offered to the rubber industry. This new product, called "Bardol," is a standardized coal tar product which, according to its manufacturers, possesses exceptionally good dispersing properties. Its specific gravity at 15.5° C. is about 1.08 and it flows freely at room temperatures. It is readily soluble in the rubber and has a relatively low tinting power.

It does not retard the rate of cure and when used with organic accelerators it possesses mild activating properties. It has good aging qualities and possesses light anti-oxidant properties.

Bardol, as a softener, imparts smooth calendering and tubing properties to the stock. In treads, it materially increases the resistance to abrasion, improves the resistance to tear and gives a good modulus. On account of its unique dispersing properties, it offers many advantages and improvements in general rubber compounding, which heretofore have not been obtained, its manufacturers say.

Numerous tests were made with various formulæ. It was found that Bardol materially increased the resistance to abrasion and resistance to tear in a selected first grade tread stock containing 5.6 parts of the new softener to 62 parts smoked sheet.

Its tensile strength remains well above 4,000 pounds per square inch at the optimum cure. Its percentage elongation is increased accordingly and its hardness, as determined by the Shore gauge, is lowered by several points. Its set is increased somewhat but remains within reasonable limits. It will also be observed that it gives a good modulus at an elongation of 300%. The formulæ and results are as follows:

Formula	*A*	*B*
Smoked Sheet	62.0	62.0
Carbon Black	22.0	22.0
Zinc Oxide	5.4	5.4
Bardol	....	5.6
Anti-Oxidant	1.0	1.0
Sulphur	2.0	2.0
D. P. G.	1.0	1.0
Total	93.4	99.0
Abrasion	343	284
Tear: Long.	76.8 lbs.	77.2 lbs.
Trans.	69.6 lbs.	71.5 lbs.

	A Tensiles Lbs.	*A* % Elong.	*A* Hardness	*B* Tensiles Lbs.	*B* % Elong.	*B* Hardness
30′ @ 40 lbs.	4560	640	63	4290	670	60
45′ @ 40 lbs.	4610	605	65	4370	640	62
60′ @ 40 lbs.	4545	585	67	4205	590	62
75′ @ 40 lbs.	4345	560	68	4150	590	62
90′ @ 40 lbs.	4260	545	68	3950	570	62
105′ @ 40 lbs.	3960	535	68	3815	570	62
*Per Cent Set (45′ @ 40 lbs.)		27			32	

	Modulus at 300% Lbs.	*Elongation* Lbs.
30′ @ 40 lbs.	1395	1210
45′ @ 40 lbs.	1590	1400
60′ @ 40 lbs.	1670	1535
75′ @ 40 lbs.	1650	1530
90′ @ 40 lbs.	1570	1500
105′ @ 40 lbs.	1660	1430

*Set was determined by stretching test-sample 75% of its elongation at break for 10 minutes and allowing to rest for 10 minutes before measuring.

Similarly, Bardol has been tested against pine tar in a selected first grade tread. The results of the test show the advantages of the dispersing oil over pine tar with respect to resistance to abrasion and to tear and also as to aging qualities. It was found that Bardol did not retard the rate of cure and that when cured with Captax, the stearic acid content could be reduced 25% with equally good results.

Bardol was tested in a zinc stock, and compared with a similar stock without the dispersing oil, it was found that the properties of the stock were materially improved. The dispersing oil increased its tensile strength and resistance to tear, and increased the rate of acceleration.

New Rubberized Fabrics

THE latest vogue of modernistic designs in raincoat finishes is featured in a display of new model raincoats now being held at the Du Pont products exhibit on the Boardwalk at Atlantic City. The coats are made of "Art Moderne" Fairfield Fabric, a new departure in rubberized fabric finishes recently developed by the rubber products division of the Du Pont Company.

New Rubberized Fabric Coat

The various modern effects are made possible through a special process wherein these effects are not printed, but are built in, an integral part of the coating, all being vulcanized into one unit, assuring permanence of design and durability of color. The designs are worked out in several harmonizing shades or in several tones of one color, including red, green, copper, brown, maroon, eggshell and ivory.

This type of material is now being used extensively for raincoats, sportswear, sport jackets, etc., and it is also rapidly extending into other fields, due to its unusually attractive appearance, which is so in keeping with the present "Art Moderne" movement.

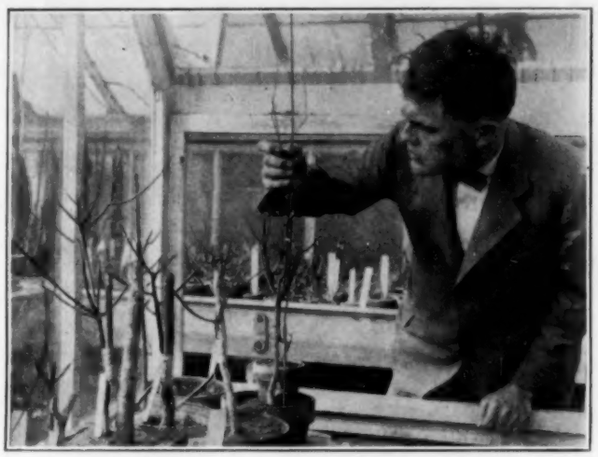
The coats made of this new material are smartly tailored according to the latest mode. They are made with raglan sleeves, storm tabs, bellows pocket, convertible collar and have double ringed, all-around belts. The coats displayed were made by the Harris Raincoat Company of New York City.

Madagascar Rubber Plants

DR. CHARLES F. SWINGLE, botanist of the Bureau of Plant Industry, recently returned to Washington from a plant-exporation expedition to Madagascar, bringing back a mass of plant material which the bureau hopes will prove to contain a number of useful and valuable additions to the ornamental and economic plant life of the United States. Doctor Swingle was accompanied on the expedition by Prof. Henri Humbert, professor of botany in the University of Algiers, Algiers, North Africa, an authority on the plant life of Madagascar. As far as there is record, Doctor Swingle is the first American botanist ever to visit Madagascar.

In the collection are 23 lots of plants which seem to have some value as potential sources of rubber. Ten of these are now being commercially exploited for rubber in Madagascar according to Doctor Swingle. Some of them have been introduced previously into the United States and are now being tested in the department's experiment garden in Southern Florida. The southern part of the Madagascar, which lies just outside the tropics in the South Temperate Zone, is like parts of our own Southwest in many respects and the bureau hopes that some of these new rubber plants may be adapted there.

Apparently the real prize of the expedition consists of live specimens of *Euphorbia Intisy*, an almost extinct species of rubber-yielding plant. Twenty-five years ago the rubber from this plant was highly prized in France for making automobile and bicycle tires.



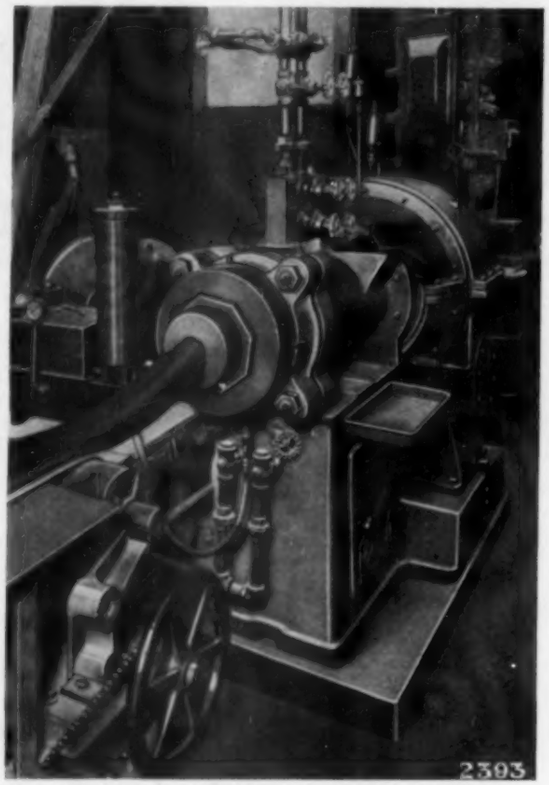
Dr. Charles F. Swingle Examining Some of the Rubber Plants Which He Collected on a Recent Expedition to Madagascar

Dr. Swingle's trip was made possible through the cooperation of the Bureau of Plant Industry with the Arnold Arboretum of Boston, the University of Algiers, and by the friendly interest and numerous courtesies of the French and Madagascar Governments.

March Rim Production Higher

OUTPUT of automobile and other rims during March was somewhat higher than that of either the previous month or March, 1928, and brought the total for the first quarter of 1929 well above the same period a year ago. During the past month the number of rims inspected and approved by the Tire and Rim Association of America, Inc., totaled 2,613,389 as compared with 2,265,024 in February and 2,423,457 in March, 1928. The total output for the first three months of 1929 was nearly 700,000 above the production for the first quarter of 1928.

Rim Size	Mar. 1929 No.	%	3 Mos. 1929 No.	%
Motorcycle				
24x3 "CC"	4505	0.2	7721	0.1
24x3 Std...	——	—	4200	0.1
26x3 "CC"	——	—	756	0.0
28x3 "CC"	683	0.0	1020	0.0
Total	5188	0.2	13697	0.2
Clincher				
30x3½ ..	28417	1.1	100924	1.5
18" Balloon				
18x4	125268	4.8	330013	4.9
18x3.25	28871	1.1	52343	0.8
18x4½ ..	29591	1.1	84421	1.3
18x5	3509	0.1	15223	0.2
Total	187239	7.2	482000	7.2
19" Balloon				
19x2.75	47447	1.8	112753	1.7
19x3½ ..	54147	2.1	278348	4.2
19x4	582333	22.3	1386021	20.7
19x3.25	——	—	64593	1.0
19x4½ ..	71315	2.7	169530	2.5
19x5	18957	0.7	34772	0.5
Total	774199	29.6	2046017	30.6
20" Balloon				
20x2.75	642352	24.6	1573575	23.5
20x3½ ..	18135	0.7	41957	0.6
20x4	295904	11.3	740986	11.1
20x4½ ..	41285	1.6	133927	2.0
20x5	31920	1.2	131320	2.0
20x6	11444	0.4	31892	0.5
20x6.75dc	1889	0.1	5611	0.1
Total	1042929	39.9	2659268	39.6
21" Balloon				
21x2.75	52449	2.0	72643	0.8
21x3½ ..	33783	1.3	91598	1.4
21x4	9982	0.4	24863	0.4
21x4½ ..	1351	0.0	11465	0.2
21x5	——	—	543	0.0
21x6	——	—	1017	0.0
Total	97565	3.7	202129	3.0
22" Balloon				
22x4	151	0.0	501	0.0
High Pressure				
30x3½-23	——	—	6188	0.1
32x4½-23	1359	0.1	16085	0.2
32x4 -24	440	0.0	6816	0.1
34x4½-25	726	0.0	1882	0.0
Total	2525	0.1	30971	0.5
20" Truck				
30x5	355111	13.6	916006	13.7
32x6	56210	2.2	120237	1.8
34x7	22226	0.9	44817	0.7
36x8	19866	0.8	40955	0.6
40x10	——	—	304	0.0
Total	453413	17.4	1122319	16.7
22" Truck				
36x7	173	0.0	173	0.0
38x8	789	0.0	1337	0.0
Total	962	0.0	1510	0.0
24" Truck				
34x5	1172	0.0	1804	0.0
36x6	3869	0.1	14754	0.2
38x7	6080	0.2	11260	0.2
40x8	8499	0.3	20671	0.3
44x10	——	—	246	0.0
Total	19620	0.8	48735	0.7
Airplane				
8x3	131	0.0	146	0.0
12x3	76	0.0	208	0.0
18x3	29	0.0	29	0.0
16x3½ (24x4) ..	——	—	954	0.0
20x3½ ..	56	0.0	137	0.0
20x4	——	—	6	0.0
20x5	209	0.0	211	0.0
20x6	23	0.0	357	0.0
20x8	7	0.0	396	0.0
24x10	——	—	109	0.0
18x4 Cl.	650	0.0	2996	0.0
Total	1181	0.0	5549	0.0
GRAND TOTAL	2,613,389		6,713,620	



Royle Perfected Tubing Machine Producing "Tubed" Inner Tubes

Whether a single Royle unit or a large scale Royle installation

for the production of inner tubes or any other tubed product you will find of special significance the unparalleled performance record of Royle Perfected Tubing Machines. Performance, in the final analysis, is what you buy in a tubing machine. Base your choice on performance and you will always specify Royle Perfected Tubing Machines.

We solicit your inquiries

JOHN ROYLE & SONS
PATERSON, NEW JERSEY

Represented by
National Rubber Machinery Co., Akron, Ohio

Modernize Your Core Equipment

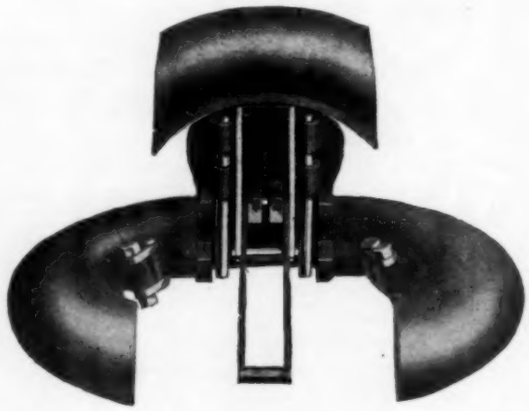
With

India Cores

The core which has found wide favor in the leading tire factories.

The India building core means a simple, well constructed, quick acting, interchangable core.

The three chucks, namely Midget, Standard, and Heavy Duty, accommodate all sizes up to and including 8-inch High Pressure and 8.25.



Write for Prices and Full Details

MANUFACTURED BY

The
BRIDGWATER MACHINE COMPANY

AKRON, OHIO

Licensed by India Mch. & Rubber Mold Co.

EDITORIAL COMMENT

Why Not Stabilize 1929 Prices?

THE outstanding event in the rubber market situation is the record breaking consumption of crude rubber during the first quarter of the year. It has already reached a total of 129,326 tons. There appears no immediate reason why this rate of consumption will lessen. Factories are reported to be producing at record capacities and the automobile industry, representing the chief buyers of tires, shows no slackening in output but on the contrary, an astounding increase. Exports of rubber goods are not declining but steadily increasing and domestic unit sales are reported as of record volume.

If this high monthly consumption persists during the remainder of the year the total absorption of the United States alone will be in the neighborhood of 515,000 tons,—a record far in excess of any predictions, however optimistic, that have ever been made by the trade. All of this presents the problem as to whether the production of crude rubber will meet this demand from the manufacturing industry. There should not be any worry on this score. The output of all producing areas, even at the present market price, is sufficient to meet these demands, for this year at least. A far more important question and one which the whole industry can profitably give more attention to, is finding some means of stabilizing the market.

The entire rubber manufacturing industry of the United States can attribute its losses last year to an artificial price for crude rubber futilely maintained in the face of an apparent adverse technical market position and an obviously top-heavy statistical position. Buying interests can well profit from that experience. A price of 20 to 22 cents per pound is fair and with production and consumption for 1929 levelling off fairly equally, a stabilization in prices in the market at the present levels can be the most hoped for prospect of the industry for both the plantation growers and manufacturers, not to mention the equally interested ultimate consumer of rubber goods.

Labor and the Industry

EMPLOYMENT in the rubber industry in the United States is 6 per cent higher today than it was a year ago and the present complement of workers will probably be maintained throughout the summer, according to the annual spring survey of the National Association of Manufacturers. The same report also states that all industries are operating at 85.1 per cent of their fullest capacities. It is probable that the rubber industry taken alone can register an even higher percentage.

When any group of manufacturers such as represented by the rubber industry report that they are employing 6 per cent more persons than the previous year, and when they are operating at 85.1 per cent of their fullest capacity, it would seem to indicate a very healthy economic and industrial condition. The rubber industry has always been fortunate in having very few labor problems. A very fine relationship has always existed between employer and employee. In fact the entire labor situation in the industry should be the basis for considerable satisfaction to the manufacturing interests and it will play no small part in whatever prosperity will come out of the industry this year.

The Rubber Footwear Surveys

MORE and more valuable service to the industry is being rendered by the Rubber Division of the Department of Commerce. The care and accuracy which has characterized the gathering of pertinent statistic data is only one example of the thoroughness with which this office of the Government operates. It is now planning to extend its services again, this time in the direction of the rubber footwear manufacturers, by organizing semi-annual surveys of footwear stocks on hand throughout the annual surveys of footwear stocks on hand throughout the country. Overstocking and problems of distribution have only too often been a source of loss in profits. With a comprehensive survey of the amount of stocks on hand, listed geographically, the manufacturers can more easily visualize his markets, approximate manufacturing needs, and save many headaches from top-heavy inventories.

Credit for this survey should go to the Rubber Division of the Department of Commerce and the footwear trade can congratulate itself in the knowledge that such surveys will be conducted in the thorough and efficient way so characteristic of all the service of this Division.

The RUBBER AGE

Published on the 10th and 25th of each month. The Only Twice-a-Month Rubber Publication.

THE PALMERTON PUBLISHING CO., INC.
Publication Office, 1-3 Peace St., New Brunswick, N. J.
Editorial Office, 250 West 57th St., New York City
Telephones: Columbus 2923, 2924

THE RUBBER AGE is published on the 10th and 25th of each month by The Palmerton Publishing Co., Inc., a New York corporation. P. L. Palmerton, President; Earl D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer. Publication Office, 1-3 Peace St., New Brunswick, N. J. Subscription rates: Domestic, $2.00 a year; Canada, $2.50; foreign, $3.00; single copies, 20c. Advertising rates on application.

Contents Copyrighted 1929 by The Palmerton Publishing Co., Inc.

General Manager ..... PETER P. PINTO
Managing Editor ..... J. P. BUSHNELL
Assistant Editor ..... T. H. DAVISON
Circulation Manager ..... F. DEZURKO

Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

SPECIAL SOFTENERS

—Better Working Properties before Cure
—Improved Vulcanized Quality
—Lower Raw Materials Cost

TASCO ASPHALT COMPANY

Akron Representative
The F. F. Myers Co.
Akron Savings & Loan Bldg.

HOME OFFICE
238 Wilson Ave.,
Newark, N. J.

Trenton Representative
F. V. Bechtel
289 North Willow St.

Warehouse Deliveries from All Agencies

Three Things to Remember

when you contract with the American Cyanamid Company for

AERO BRAND
RUBBER SULPHUR

You have no further uncertainties concerning favorable price, uniform highest quality, and dependable deliveries.

A specially prepared sulphur for the rubber industry. Air-floated and bolted through silk. Let us give you quotations for spot shipment or contract.

Other Aero Brand Rubber Chemicals are D-P-G (Diphenylguanidine) and D-O-T-G (Di-ortho-tolylguanidine), accelerators.

Write Industrial Chemicals Division

American Cyanamid Company
535 Fifth Avenue, New York

COOPER GUARANTEED PRODUCT

QUALITY CHEMICALS
for the
RUBBER INDUSTRY
Stocked at Akron, Ohio.

Aniline Oil
Pine Tars
Co-Flux
Gasoline
Soap Bark
Palm Oils
Hardwood Pitch

R. A. SPERRY
Akron Manager
134 E. Miller Ave.
Phone
Main 1898

Red Oxide
Benzol
Toluol
Sol. Naphtha
Crude Sol. Naphtha
Naphthalene
Cresylic Acid

WILLIAM COOPER & NEPHEWS
INCORPORATED
1909-25 CLIFTON AVE. CHICAGO, ILL.

SHORT NEWS & DEPARTMENTS

Names in the News
Rubber Goods & Specialties
Foreign Rubber News
Crude Rubber Items

NEW RUBBER PLASTICS ARE GRANTED PATENTS

William Burton Westcott has assigned to the Rubber Latex Research Corporation a patent for a new plastic from rubber latex and asbestos. Acid washed asbestos and uncoagulated latex form the basis of one plastic, and another is composed of acid washed asbestos and gelled latex. A third material under the patent is a plastic composed of acid washed asbestos bonded by an integral body of rubber derived from latex, the rubber permeating the fiber bundles. The patent also covers the process of making asbestos containing plastics which comprises extracting asbestos with acid washing and admixing the extracted asbestos with latex.

A rubber and cumaron resin composition has been patented by Stuart P. Miller and assigned to the Barrett Company. When about 8 per cent by weight of crude, unvulcanized rubber is dissolved in cumar of a melting point between 125 and 128 degrees Centigrade, by melting the cumar and stirring pieces of rubber therein, the melting point of the mixture becomes about 123 degrees Centigrade.

Earl G. Sturdevant has assigned to the Western Electric Company his recent patent for flame-proof electrical insulation of rubber, chloronaphthalene, silica and vulcanizing agents. This electrical insulation comprises substantially 20 parts of rubber, 25 parts of chlorinated naphthalene, 2 parts of sulfur, 10 parts of litharge, and 33 parts of powdered silica.

GODFREY L. CABOT PLANS CARBON BLACK EXPANSION

The plant expansion program of Godfrey L. Cabot, Inc., for 1929 will include additions to present plants at Skellytown and Pampa, which are already the two largest carbon black plants in the world, and also new plants at Kingsmill, Tex., in Moore County, Tex., and in Seminole County, Okla.

The plant in Seminole County is a wholly new development, in that carbon black will not be produced from natural gas, but from certain fractions of raw gasoline which are removed in the last refining process and are at present being wasted. These fractions will be purchased under long term contracts from several gasoline plants and will be conveyed to the carbon black factory through pipe lines, where they will be vaporized before burning.

Upon the completion of the plant at Kingsmill, the main research laboratory for the Cabot interests will be moved there. A model town is being built near the Kingsmill plant for the housing of the staff.

The Cabot company states that the exclusive control tests developed in their laboratories have been an important factor in the expansion of sales.

Seiberling Brothers Divided On Akron-Barberton Merger

Frank A. Seiberling, president, and Charles W. Seiberling, vice-president, of the Seiberling Rubber Company, voice opposite opinions on the proposed annexation of Barberton, O., to Akron. Both agree that Barberton should and will some day be annexed, but "F. A." believes the earliest moment is not too soon. His brother believes the time for annexation is not yet ripe and says, "My main argument against the merger now is that Barbertons' tax rate is lower than Akron's."

This is the second public question they have not seen in the same light during the past twelve months. In the presidential primaries last year, Frank A. Seiberling favored the late Senator Frank B. Willis for Ohio's choice for president. Charles W. Seiberling backed Herbert Hoover.

Patent Suit Against Voit

A suit for infringement of patents covering the "Ball-O-Fun," invented by Mitchell Carter and manufactured by the Rubber Patents Corporation, Grand Rapids, Mich., has been filed against the W. J. Voit Rubber Company, Los Angeles, Cal. This suit is now pending in the United States District Court, Southern District of California.

Endicott-Johnson Nears Peak

The Endicott-Johnson Corporation, Johnson City, N. Y., is running capacity production at their Jigger factory, where the tennis and canvas footwear are produced, 15,000 pairs being manufactured daily. Samples of heavy footwear are being manufactured and the company is expected to enter this field later in the year.

Boston Woven Hose Moves Plant

The reclaimed rubber plant of the Boston Woven Hose and Rubber Company, now located at Plymouth, Mass., will be moved to Cambridge adjacent to the main plant of the company, according to a recent report. The company recently purchased 75,000 feet of additional floor space for this purpose. The change will save considerable in transportation charges and give the company the advantage of centralized manufacturing conditions.

RUBBER FIRMS EXHIBIT AT CHICAGO TOY FAIR

The Chicago Toy Fair, which opened on April 15 and is to continue until April 27, has been the largest exhibition of its kind ever held in that city, both the number of exhibits and the number of attending buyers exceeding all previous records. Many manufacturers of rubber toys maintained exhibits either at the Hotel Morrison, the Palmer House or the Hotel Sherman.

The Paramount Rubber Company showed a large line of rubber balls and other novelties, and the Brunswick-Balke-Collender Company displayed its miniature rubber-cushioned billard tables. The Keystone Manufacturing Company exhibited its line of rubber-tired toy automobiles and trucks, and the Frier Steel Company showed its Cozytown houses with rubber legs. A feature of the exhibit by the Toy Tinkers, Inc., was its new Tinker Go-Round, a fascinating novelty with an elastic rubber band as its motive power.

GOODYEAR GIVEN USE OF WESTERN AIRSHIP BASE

The United States War Department has given permission to the Goodyear Tire & Rubber Company to use a hangar at Ross Field, Arcadia, Cal., for one year as a base for the assembling and operation of a non-rigid, helium airship, it was announced on March 30. The airship, which is to be a sister ship of the *Puritan*, will be christened the *Mayflower*, and, if sent to California for assembly and test, will be ready on April 25.

The Goodyear company announced, however, that the ship might be assembled at Wingfoot Lake, Akron, and tested there, in which event it would be flown to California about June 20. The *Mayflower* will serve in a capacity similar to that of the *Puritan* in west coast service, and all leading cities of California, Washington and Oregon will be visited during the coming year.

S. A. E. Plans Summer Meeting

The summer meeting of the Society of Automotive Engineers will be held this year for the first time in the Adirondacks at Saranac Lake, N. Y., the dates being June 25 to 28. Committees are arranging details for the technical sessions.

Hood Rubber Plant Busy

The Hood Rubber Company reports improved business since the first of the year, particularly in the tire and canvas footwear divisions. Canvas footwear production recently reached 45,000 pairs a day, a new record for the plant. Hood has a capacity of 90,000 pairs a day of all kinds of footwear, including canvas.

MASSACHUSETTS FIRMS ACTIVE IN SAFETY WORK

Local rubber companies were largely represented at the "smile party" of the Engineering Section of the Massachusetts Safety Council held at Walker Memorial Building, Massachusetts Institute of Technology on April 11, starting with a dinner at 6:30 p. m. "Is the Foreman Responsible for Accidents That Occur in His Department?" was the title of a play portraying this problem, followed by musical and dancing numbers by members of the different companies' organizations. Converse Rubber Company and Hood Rubber Company were represented by large delegations. The Converse Company has just joined the Council.

On April 29 and 30 the Eighth Annual Safety Conference on Highway and Industrial Safety will be held at the Hotel Statler, Boston, Mass. Discussion on "Does Health Supervision in Industry Reduce Accidents?" will be led by Dr. Robert S. Quinby, Service Manager of the Hood Rubber Company, Watertown.

Goodyear Rubber Company Busy

The Goodyear Rubber Company, Middletown, Conn., makers of Gold Seal rubber footwear, is maintaining a high schedule of production to meet the demand for its products. The present Goodyear Rubber Company was incorporated on January 10, 1929, to continue the business started in 1872, and was financed through an issue of preferred stock sold almost entirely to Middletown citizens. The officers are Harold S. Guy, president; Daniel E. Gray, vice-president in charge of sales; Arthur McDowell, vice-president in charge of manufacturing; and Charles M. Park, treasurer.

Urge Akron Field Port of Entry

Business men of Akron, O., headed by Vincent Stevens, are urging that Akron be made an official airport of entry so that products brought from Canadian factories of Akron companies may be cleared through the customs house in that city. "The B. F. Goodrich Company, Goodyear Tire & Rubber Company, and Firestone Tire & Rubber Company of Akron have branch plants in Canada," says Mr. Stevens, "and it is desirable that Akron be made an airport of entry to facilitate these companies in their operations with their Canadian plants."

Puritan Plans New Building

The Puritan Rubber Company, Trenton, N. J., is having plans drawn for the erection of a three-story addition to its plant in East Trenton. The building will cost $20,000 and will materially increase the company's capacity for producing rubber tiling and mats.

Ziegfeld Uses Helium Balloons

Florenze Ziegfeld, producer of "Whoopee," a popular New York musical show in which large numbers of rubber balloons are used, is spending hundreds of dollars for helium with which to inflate the balloons. Helium gas, although expensive, has the advantage over hydrogen of being non-inflammable, and is coming into greater use for toy balloons, according to the Oak Rubber Company, Ravenna, O., which furnishes the balloons for the Ziegfeld show.

Maurice Switzer

Maurice Switzer, vice-president of the Kelly-Springfield Tire Company and a well-known author, essayist and advertising man, died of heart failure on April 7 at Atlantic City, N. J., where he had been recuperating from a nervous breakdown, which had incapacitated him for about a month. He was widely known in the rubber and automobile

industries through his association with the Kelly-Springfield Tire Company over the past 14 years, first as advertising manager, but later as vice-president, a director and a prominent factor in the guidance of its affairs.

Mr. Switzer was quite as well known in the fields of art and literature, where he was at all times a welcome and discriminating figure. His keen wit and rich humor ran through all his published works, the titles of which include *Wild and Tame Advertising, Cashing In on What You've Got, Trying It on the Dog, Letters of a Self-Made Failure* and *Who Pays the Advertising Bills?*

Born in New Orleans, La., October 16, 1870, and educated in the public schools of that city, Mr. Switzer's first work was that of advertising manager of the Havana-American Company, cigar manuafcturers. Following this, he served for 10 years as advertising manager of the Wilson Distilling Company and during this period his fondness for satire developed with the result that he devoted a couple of years to the fortunes of *Leslie's* and *Judge*. Then followed his entrance into the tire field and the creation of that light and semi-humorous advertising style that has done so much to make the appeal of the Kelly-Springfield line distinctive.

CANADIAN GOODRICH HAD 1928 PROFITS OF $2,130

The trading profit of the Canadian Goodrich Company, Ltd., for the year ended December 31, 1928, amounted to $296,270. Out of this, $150,424 was provided for depreciation, $54,372 was paid in interest on loans, $73,402 went in interest on income bonds, $15,930 was paid in interest on first mortgage bonds, and $11 was provided for Dominion income tax, leaving a net profit for the year of $2,130.

Earnings for the past year were adversely affected by the drastic decline in the price of crude rubber, but sales have been maintained at a high volume and are expected to show steady increases during 1929.

Boston Rubber Shoe Busy

As the result of the closing of plant No. 2 at Melrose, Mass., plant No. 1 of the Boston Rubber Shoe Company at Malden has increased its schedules on gum shoes anl has been advertising for help. The boot making section at Melrose has been transferred to the Naugatuck, Conn., plants.

Arlington Buys Killion Plant

The Arlington Rubber Company, Everett, Mass., manufacturers of golf balls, have purchased the heel and sole plant of the Killion Rubber Company, Clayton street, Dorchester, and have moved their plant to this location. F. W. Bommer, formerly with the Converse Rubber Company and the Lambertville Rubber Company, is manager.

Mohawk Dividend Expected

The directors of the Mohawk Rubber Company will meet in the near future, and it is expected that the board will vote on the resumption of dividends on the common stock. During 1928 the company earned $766,040, and S. S. Miller, president, reported to shareholders at the time that "the earnings continuing at a rate comparable with, or in excess of the earnings of last year, should make it possible for the directors to resume in the near future the cash dividends on the common stock." It is expected that both cash and stock dividend policy will be adopted.

RUBBER COMPANY STOCKS LOWER IN LIGHT TRADING

During a fortnight of comparative inactivity on the stock exchanges of various cities, the issues of 17 rubber companies fell off slightly in price, while the shares of 6 rubber companies showed gains. Both the common and first preferred stocks of the Fisk Rubber Company declined to new low levels for 1929, but have since shown a tendency to rise again.

Among the stock issues not listed below, U. S. Rubber Reclaiming common on the New York Curb Exchange has been a leader in recent weeks, rising from a low of 16 to 31 and falling back only slightly by the end of the period.

Late Stock Prices

	Last Price Apr. 19	Apr. 3	High —1929—	Low
Ajax	8	8¼	11¼	7⅞
Falls	6¾	7½	11⅝	5
Faultless	35⅝	36	39⅞	33
Firestone	259	253	285	220⅛
do. 6% pfd.	108⅝	110	111	108¼
Fisk	11¼	12	20⅛	10⅞
do. 1st pfd.	60	60¼	82½	59
General	290	290	298	236
do. pfd.	100	100	102	99½
Goodrich	85¾	90⅜	105¾	83⅝
do. pfd.	113¾	113	115¼	113
Goodyear Com.	130⅜	135	154½	112
do. pr. pfd.	104	103	104⅞	101⅜
Hood	—	22	27¼	21
India	60¼	61	73	39
Intercontinental	9¼	10½	14¼	10
Kelly Springfield	16⅝	15⅞	24	11
do. 1st pfd.	—	—	100	88
Lee	18⅞	19	25	18½
Miller	24⅝	25½	28¾	22½
do. pfd.	76	81	83	70¼
Mohawk	61	53	66	53
do. pfd.	85	87¼	90½	81
Norwalk	—	5	6¼	5
Seiberling	48¾	51	65	47½
do. pfd.	106	105¼	107⅞	105
U. S. Rubber	53⅞	55	65	42
do. pfd.	81¼	83½	92½	77

L. ALBERT & SON OFFER RUBBER MACHINERY STOCK

Through the purchase of five additional plants, L. Albert & Son, Trenton, N. J., and Akron, O., have considerably augmented their stock of rubber working machinery. The newly purchased plants include those of the Columbus Tire & Rubber Company, Columbus, O.; Tubeless Tire & Rubber Company, Millersburg, O.; Raymond Rubber Company, Titusville, N. J.; Co-operative Rubber Company, Northport, N. Y.; and Springdale Rubber Company, Springdale, Conn.

These plants are in addition to the firm's present dismantling activities of the Perfection Tire & Rubber Company, Fort Madison, Ia.; Colonial Tire & Rubber Company, Anderson, Ind.; and Racine Horseshoe Tire Company, Racine, Wis. L. Albert & Son declare that they are at present offering to the trade the largest stock of used rebuilt guaranteed rubber working machinery with an efficient erection and engineering service.

GOODYEAR BALLOON WILL USE NEW PILOT DEVICE

During the national balloon race to start from Pittsburgh on May 4, Ward T. Van Orman, pilot of the Goodyear Tire & Rubber Company entry, will make use of a new navigational aid which will enable him to plot his exact position in less than two minutes. Mr. Van Orman, a pioneer in the use of navigational instruments for free balloons, was the first man to use the radio compass and the mariner's sextant in balloon flights.

It has also been announced that Alan L. MacCracken of the Goodyear-Zeppelin Corporation will act as aid to Mr. Van Orman, who in the past has won four national and one international contests. Mr. MacCracken, a graduate of Lafayette College, is a qualified balloon and airship pilot. The balloon the two men will fly has just been completed and is to be known as the "Goodyear VII."

Seiberling to Erect Medical Home

More than 200 Akron doctors and dentists expressed their endorsement on April 2 of the $1,000,000 medical arts building that F. A. Seiberling, president of the Seiberling Rubber Company, will build on a site next to the Akron post office. At Mr. Seiberling's invitation the Summit County Medical Association held its monthly meeting at his home and invited the Summit County Dental Association to join it. Mr. Seiberling declared that he wants the building to be a memorial to his family and himself and a monument to the medical and dental professions of the city.

New Auto Parts Factory

The J. & M. Machine Company, Cleveland, O., has leased a part of the Clydesdale Company Building at Clyde, O., and expects to begin production by May 1. The company makes a patented section of the steering wheel for automobiles and has a contract with the United States Rubber Company to produce 2,000 wheels a day as soon as the plant is in running condition.

C. HAROLD SMITH SEEKS TO SPEND $10,000,000

C. Harold Smith, president of the Binney & Smith Company, New York City, carbon black manufacturers, is credited by an article in the New York *Sun* with having a fortune of $10,000,000 to give away and with being willing to pay $1,000 for the best suggestion he receives as to its disposal. Mr. Smith has amassed a fortune estimated at above $15,000,000, has made generous provision for his family and heirs, and wishes to find a means of leaving the remainder that will not disturb his conscience, according to the newspaper article.

Mr. Smith recently published "The Bridge of Life," the second volume of the autobiography of his unusual life, describing his early education, his adventures in the South Seas, his attempt at suicide in New York, and his ultimate climb to affluence.

Goodyear Sued for $200,000

Mrs. Mary Lewis of Akron has filed a $200,000 personal injury suit in common pleas court against the Goodyear Tire & Rubber Company on behalf of her fifteen-year-old son, Leslie, for injuries alleged to have been received April 29, 1928, when a drum of explosive material blew up on the company's property. The company is charged with negligence for leaving a drum of explosive material in an unfenced lot to which children had access.

Rebuild National Aniline Plant

Work is proceeding on the reconstruction necessary on the Buffalo, N. Y., plant of the National Aniline & Chemical Company. This factory was partly wrecked on March 13 by two explosions, which resulted in one death, a score of injuries, and damages reported at $350,000.

ACCOUNTANTS MEETING OF THE RUBBER ASSOCIATION

A meeting arranged by the Accounting Committee of the Rubber Association of America, Inc., for discussion of specific accounting problems within the industry was held at the Akron City Club, Akron, Ohio, on Friday, March 29. The subject assigned for the meeting was "Forecasting Raw Material Requirements and the Accounting Control of Materials." A most interesting and informative discussion was had under the leadership of W. M. Bechler, assistant comptroller of the B. F. Goodrich Company.

The meeting was not confined to members of the Accounting Committee and was well attended, thirty-three members and guests, representing twenty-two companies, being present.

The next meeting of the committee will be held in New York in May, on a day to be announced later.

Dill Issues Handbook

Furnishing dealers with complete information regarding tire valve and valve part application and replacement is the purpose of a new handbook now being distributed by the Dill Manufacturing Company, Cleveland, O. Besides illustrated descriptions of Dill valves and valve parts, the manual contains latest valve and valve part practices adopted by the Tire and Rim Association of America, standard valve changeover information and cross index of Dill products with corresponding products of other lines.

Johnson Adds New Equipment

The Johnson Rubber Company, Burton, O., is preparing to install enough machinery to double its present output of rubber tubing, strip rubber and channel. The additional machinery will add a considerable number of employes to the company's payroll as soon as it is completely installed.

Rubber Bumper for Bus Protection

THE omnibus in the picture is shown making an actual test of a new rubber bumper, said to give increased protection to the occupants of this type of vehicle. The bus was fully protected when it rammed into the tree, and the bumper, unlike those of steel, was not bent out of shape beyond hope of repair.

Rubber News Around the World

MEMORIAL BUST PROPOSED FOR SIR HENRY WICKHAM

Proposals for some simple form of permanent memorial to Sir Henry Wickham, father of the rubber plantation industry, have been made in England by many of his former friends and acquaintances. William Duncan, A. Oliphant Devitt and Fordyce Jones have been asked on behalf of the producing, trade, manufacturing and distributing interests to act as a small unofficial committee to arrange details.

A suggestion has been made that an appropriate form of memorial would be a marble bust to be placed in the building of the Royal Empire Society (formerly the Royal Colonial Institute) where the late Sir Henry spent many of the later years of his life. From private inquiries made, there is every reason to believe that the Council of the Society would fall in with the suggestion.

A large sum of money is not required. The committee has stated that the Rt. Hon. Lord Colwyn, P. C., has intimated that he will be pleased to head the list with a donation of five guineas, and various sums ranging from a guinea and upwards have been received or promised. Donations of any amount will be welcomed, as it is desired that the list should be open to all who woudl like to be associated with the proposal. If a larger total amount is received than is necessary for the marble bust, it will be devoted to some other suitable form of memorial, such as bronze replicas for presentation to organizations connected with the rubber industry in various parts of the world.

Donations should be forwarded to F. G. Smith, 2, Idol Lane, Eastcheap, London, E. C. 3, who has consented to act as honorary treasurer of the fund. Checks should be made payable to the Wickham Memorial Fund.

ANGLO-DUTCH PLANTATIONS SELL NEW CAPITAL ISSUE

The Anglo-Dutch Plantations of Java, one of the largest of British rubber companies, is making a further issue of 6 per cent first mortgage debenture stock, the amount being £400,000. This stock, which is being offered to shareholders and debenture holders at the price of 96, will rank equally with the existing £500,000 of first mortgage 6 per cent stock issued two years ago when the price was 98.

As practically the whole of the 5 per cent convertible debenture stock has been converted into ordinary shares, the 6 per cent stock will represent the bulk of the company's debenture debt ,the total of which, under the existing articles, may not exceed £1,000,000. The new issue, which is not being underwritten, is understood to be connected with the company's subsidiary, the Sumatra Anglo-Dutch Estates, which was formed in 1925 to acquire a large acreage for rubber, coffee and tea planting.

Du Cros Visits America

Sir Arthur Philip Du Cros, president and life director of the Dunlop Rubber Company, Ltd., photographed on his arrival at New York April 3, on the S.S. Paris. After a brief business visit, Sir Arthur sailed for England on the S.S. Leviathan on April 10. His residence at Bognor, England, known as Craigwell House, is now being used by King George for his convalescence.

German Combine Reported

Negotiations are now being carried out between the Peters Union and the Continental Rubber companies which are expected to lead to the formation of a new merger, according to officials of both concerns. Estimates figure that Continental tires accounted for about 35 per cent of the total German domestic sales of tires during 1928. Peters Union recently declared a dividend of 8 per cent for the business year 1927-28. Earlier this year the B. F. Goodrich sold its holdings in the Continental Rubber Works, amounting to 25 per cent of the total capital of 45,000,000 marks, to a German consortium headed by the Darmstaedter and Nationalbank.

AUSTRALASIAN DUNLOP TO INCREASE CAPITAL

A meeting of shareholders of the Dunlop Rubber Company of Australasia will shortly be held to sanction an increase in the capital from £3,475,000 to £6,000,000 by the creation of 2,525,000 new £1 shares. Of the increased shares to be issued, 41,000 will be 10 per cent preference ranking equally with the present preference and part of the remainder in ordinarys, both applicable in the first place to the agreement with the Perdriau Rubber Company.

It is proposed to increase the number of directors from 10 to 15, including Henry Perdriau, E. M. Perdriau, Sir George Beharrell, Sir Eric Geddes, W. L. Baillieu, W. A. Watt, and F. S. Ormiston, representing the Barnet Glass Rubber Company. Mr. Watt is to be chairman and E. M. Perdriau vice-chairman.

DR. BARR STUDIES AGING OF COTTON IN RUBBER

Speaking on March 21 before the Manchester and District Section of the Institution of the Rubber Industry on "The Aging of Cotton Contained in Rubber Goods," Dr. Guy Barr gave the results of a series of experiments he has carried out. The cotton was attacked, he said, long before the rubber was seriously affected.

Dr. Barr described in detail some of the tests he has made on the weathering of balloon fabrics and also some investigations he made about 12 years ago on the behavior of rubbered cotton in the tropics. He found two causes of aging or deterioration during service, one being sunlight and the other being acidity left in the fabric during manufacture or produced during service.

Dr. Barr said he found that exposure under the light of the mercury arc attacked the cotton seriously before affecting the rubber to any large extent, a result that was not expected. Under tropical exposures the rubber perished rapidly, with simultaneous production of acidity on the surface. Even the order of merit assigned to different productive colorings was very different in the two cases.

Discussing the spectral distribution of the rays causing the deterioration of cotton, Dr. Barr said that aging seemed to be caused chiefly by rays just below the visible spectrum.

Embargo on El Popo Tires

Cia. Hulera el Popo, S. A., was embargoed recently by the Mexican government, owing to the fact that the controlling shareholder of this company, Roberto Cruz, is one of the leaders of the present revolution in Mexico. This company has of late been curtailing the manufacture of tires and increasing its output of tubes, which is approximately 200 daily. Until the present rebellion, an official order decreed that Popo tires should be used on all government cars.

THURE MELANDER, manager of the Copenhagen branch of the Goodyear Tire & Rubber Company, has arrived with Mrs. Melander at his European post after a visit to the factories at Akron, O. He sailed from New York on March 30.

CATALPO
for
Inner Tubes

Names in the News

L. P. McGoff, who has represented the Boston Woven Hose & Rubber Company in Cincinnati, O., for several years has returned to New England to devote himself to a special type of field work in the northeastern states. C. W. Stanton, formerly Denver representative of the company, will move to the Ohio territory with headquarters at Cincinnati, and H. S. Merrill will take over the Denver territory. Mr. Merrill, a new member of the firm's sales force, was for six years with the B. F. Goodrich Company and for eight and a half years with the Boston Belting Company.

Hugh Allen, manager of publications for the Goodyear Tire & Rubber Company, will again be special representative of Dr. Hugo Eckener, when the distinguished dirigible commander brings the *Graf Zeppelin* to the United States next month. He handled the general arrangements for Dr. Eckener on the first visit of the airship last October, while Dr. Karl Arnstein looked after the technical arrangements.

C. W. Seiberling, vice-president of the Seiberling Rubber Company, spoke on April 1 before the members of the industrial assembly of the Goodyear Tire & Rubber Company. He recounted the founding of the Goodyear organization when he, his father, and brother, Frank, started operations in what was then an old strawboard factory on July 1, 1898, making bicycle tires.

J. Chester Cuppia of E. A. Pierce & Company was guest of honor recently at a testimonial dinner tendered him by fellow members of the New York Curb Exchange at the Biltmore Hotel, New York City. Mr. Cuppia recently purchased a seat on the New York Stock Exchange, making him a member of 10 exchanges throughout the country, including the Rubber Exchange of New York.

Phil J. Kelly, advertising manager of the B. F. Goodrich Company, spoke before the members of the Cleveland Advertising Club on April 5 on "Making an Advertising Policy a Reality Instead of a Dream." Mr. Kelly recently returned from a trip to San Antonio, Tex., made by Cy Caldwell, pilot, in the Goodrich Silvertown airplane.

W. K. MacPherson, formerly of the Hewitt Rubber Company, Buffalo, N. Y., and the B. F. Goodrich Company, Akron, O., recently joined the technical sales department of the R. T. Vanderbilt Company, New York City, covering the New York metropolitan district and the middle Atlantic states.

Cy Caldwell has resigned his post as "companion-pilot" for the B. F. Goodrich Company's Fairchild plane, "Silvertown," in order to devote most of his time to writing for a national aeronautical magazine. Leo Schoenhair has succeeded him as pilot of the Goodrich plane.

W. H. WHITCOMB JOINS HENRY L. SCOTT COMPANY

W. H. Whitcomb, for 12 years director of the footwear division control laboratory of the United States Rubber Company, New Haven, Conn., has joined the technical staff of the Henry L. Scott Company, Providence, R. I., manufacturers of testing machines. His new work will embrace sales, technical service, outside development of activities, and other executive duties, and he will represent the organization at the meetings of the American Chemical Society.

Mr. Whitcomb received his degree of Bachelor of Science in 1903 and Master of Science in 1906 from the Massachusetts Institute of Technology and also was a

W. H. WHITCOMB

graduate student at Harvard University during 1911 and 1912. He acted as an assistant in physics and electrochemistry at M. I. T. in 1903 and 1904 and as an assistant in physics at that institution during 1905 and 1906.

Upon leaving M. I. T., Mr. Whitcomb became affiliated with the department of chemistry at Miami University, Oxford, O., serving as assistant professor from 1906 to 1910, as associate professor from 1910 to 1913, and as professor of chemistry from 1913 to 1917. Since the latter date he has been director of the control laboratory of the United States Rubber Company's footwear division, his work comprising supervision of chemical and physical testing of materials, development and testing of compounds, control testing of finished goods for quality of manufacture, and inspection and testing of fabrics.

Mr. Whitcomb is a member of the American Chemical Society and of the American Society for Testing Materials. He will continue his activities with the latter organization, which he is serving as chairman of Committee D-13 on Textile Materials, and will also maintain contact with the cotton manufacturers' associations.

Donald Guidici has been appointed manager of the new London branch of the Seiberling Tyre Company (Great Britain), Ltd. The location of the new branch is at 7 Hertford street, London, W. 1.

V. B. Myers has taken over the Detroit, Mich., territory for the Dill Manufacturing Company of Cleveland, O., succeeding E. V. Rohr. B. S. Byall is succeeding H. E. Black in the Philadelphia, Pa., territory, and J. F. McDaniel has been put in charge of the Chicago, Ill., territory. L. F. Body, sales manager of the Dill company, reports that volume for the first quarter has been very satisfactory and that the company is now doing valve equipment business with 56 tire manufacturers.

H. M. Baker, manager of the sales personnel department of the B. F. Goodrich Company, was a speaker at the meeting of the Rotary Club of Kent, O., on March 26 at the Franklin Hotel in that city. He discussed the general subject of rubber from plantation to finished product.

Frank Petrie, formerly aviation editor of the Columbus, O., *Dispatch*, joined the publicity department of the Goodyear Tire & Rubber Company at Akron on April 1. With Paul Wilson of Little Rock, Ark., he will handle most of the company's aeronautical publicity.

Bruce Bedford, president of the Luzerne Rubber Company, Trenton, N. J., has returned with Mrs. Bedford from a trip to Nassau, Bermuda.

Jacob Pfeiffer, chairman of the board of the Miller Rubber Company, was re-elected a director of the Ohio Chamber of Commerce at the annual meeting held at Columbus, O., on March 22. R. H. Miner of the Goodyear Tire & Rubber Company, was a delegate to the session.

J. P. Schiller, Pacific coast manager of the Dayton Rubber Manufacturing Company, was a recent visitor to the company factory at Dayton, O.

John P. Costello has been appointed general manager of the C. Kenyon Company of California, the coast branch of the C. Kenyon Company of Brooklyn, N. Y., manufactures of tires and tubes. The headquarters of the coast organization have been moved to the Costello Building, San Francisco, Cal. A. F. Reineman has been chosen to act as credit manager.

William O'Neill, president of the General Tire & Rubber Company, recently enjoyed a brief vacation period at Miami, Fla., in company with Mrs. O'Neil, before beginning an inspection tour of Birmingham, Memphis, and other southern cities.

Current Crude Rubber Items

RUBBER BEARING PLANTS DISCOVERED IN RUSSIA

The Moscow *Agricultural Gazette* publishes details of various species of rubber-bearing plants recently discovered growing wild in parts of the U. S. S. R. A species of the "Hondrilla" plant has been found in Central Asia, which has an excrescence at the root weighing between one-half a pound and a pound. This excrescence consists of sand cemented by the "Hondrilla" juice. After the sand is washed out a rubber-like substance remains, constituting about 20 per cent of the total weight of the excrescence. Of this substance one-half is rubber and the rest a pitch-like substance, which is added to pure rubber in the manufacture of rubber products.

The articles produced from this material readily lend themselves to vulcanization. According to a number of reports from Kazakstan, Kirghizia, and Turkestan the "Hondrilla" plant growing there could yield thousands of tons of rubber annually. It is intended to organize an extensive exploration of the territories in which these and other rubber-bearing plants are found to grow.

RUBBER QUOTATIONS FALL MORE THAN THREE CENTS

Price quotations on the Rubber Exchange of New York, Inc., dropped during the past fortnight from 22.60 to 19.40 cents a pound for spot and April contracts. The declines in the more distant positions were not quite as marked, contracts for delivery from October, 1929, to March, 1930, falling off 290 points on each position.

Except for brief rallies on April 8 and 9, the trend of the market was consistently downward on every day during the past two weeks. Waves of bearish selling, in which London interests played a prominent part, carried the quotations for futures down sharply in the closing days, and the final two trading sessions saw rubber below the 20-cent level for the first time since January 19.

The table below indicates the daily fluctuations in prices on the Exchange and the daily volume of sales.

Rubber Production in 1928 Estimated at 658,000 Tons

The latest estimate of 1928 rubber production (net exports, dry weight) by the Rubber Division of the United States Department of Commerce is 658,000 long tons. According to the best figures available, this output was divided as follows:

British Malaya	299,652
Netherland East Indies	225,983
Ceylon	57,267
India	10,790
Sarawak (Malayan imports from)	10,087
British North Borneo (last quarter estimated)	6,505
Siam (Malayan imports from)	4,818
Indo-China	9,548
Brunei (Malayan imports from)	484
Philippine Islands	309
Papua, Samoa and Fiji	738
Amazon Valley	21,129
Other American, except Guayule	1,490
Guayule Rubber (U. S. imports)	3,076
Africa	6,124
Total	658,000

Rubber Output Lower

Crop statements recently issued by the rubber plantation companies indicate that the "wintering" period substantially reduced outputs during February and smaller shipments during the latter part of that month and during March have been the result. Eric Miller recently stated at the meeting of the Bah Lias Estates that the period of maximum demand was synchronizing with the period of lowest production and, while some addition may be seen to stocks in the latter part of the year, present indications point to a further decline in stocks in consuming countries.

An important syndicate connected with the London tea trade has purchased a large block of property in the metropolis running from Rood Lane to Mincing Lane, with a frontage on Fenchurch street. It is intended to construct a block of modern offices and a new auction salesroom for the tea industry. There will also be space that could be used for a new and enlarged Rubber Exchange, and rubber interests are being approached with the idea of moving the exchange to this new location.

RUBBER INSTITUTION HAS NEW COLWYN MEDAL RULES

The Institution of the Rubber Industry has drawn up new regulations to govern the award of the Colwyn Gold Medal for the year 1928. The medal will be given this year for the best essay, submitted by a member of the rubber industry of British nationality who has not completed his 25th year on January 1, 1929. Contestants do not have to be members of the I. R. I.

The subject this year is to be "The Characteristics and Applications of Rubber," and the essays must be of 5,000 words or less and must be accompanied by a brief summary not exceeding 200 words. Each essay must be submitted under a *nom de plume*, the actual name and address of the author being enclosed in a sealed envelope, and the identity of each author will be treated as strictly private until permission has been obtained to publish his or her name.

Essays must be submitted in time to reach the I. R. I. offices at Faraday House, 10 Charing Cross Road, London, not later than September 1, although papers from contestants overseas will be received up to October 1. The selection of the winning essay will be in the hands of the Council of the I. R. I., and the presentation of the medal will be made at the annual general meeting of the Institution.

To Gather Rubber Statistics

The report of the Controller of Rubber, Straits Settlements and Federated Malay States, on the operation of restriction during the last years of the Stevenson Act, besides reviewing the reduced assessment of standard production, the appeals against reduced assessments, the drop in value per ton of rubber exported after the announcement of last April, etc., goes on to state that the continuance of valuable statistical data is covered by an amendment to the Supervision of Rubber Enactment, that an experimental program of gathering statistics is being carried on for six months, and after that the subject will be further considered. The report states further that statistics of acreage planted to rubber in Malaya are being prepared and will be published later.

Closing Prices on Rubber Exchange of New York, Inc.

FROM APRIL 4 TO APRIL 19, 1929

		Spot	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Sales*
Apr.	4	22.60	22.60	22.70	22.90	23.10	23.30	23.40	23.40	23.50	23.60	23.70	23.80	23.90	686
	5	22.30	22.30	22.60	22.90	23.10	23.20	23.30	23.30	23.40	23.50	23.60	23.70	23.80	522
	6	22.00	22.00	22.30	22.60	22.80	22.90	23.00	23.10	23.20	23.40	23.50	23.60	23.70	473
	8	22.30	22.30	22.40	22.60	22.70	22.90	23.00	23.10	23.20	23.30	23.40	23.50	23.60	643
	9	22.40	22.40	22.50	22.70	22.90	23.10	23.20	23.30	23.40	23.50	23.60	23.70	23.80	240
	10	22.10	22.10	22.30	22.50	22.70	22.80	22.90	23.10	23.20	23.30	23.40	23.50	23.60	312
	11	22.10	22.10	22.40	22.60	22.80	22.90	23.00	23.10	23.20	23.40	23.50	23.60	23.70	711
	12	21.60	21.60	21.90	22.10	22.30	22.40	22.60	22.60	22.70	22.80	22.90	23.00	23.10	1,158
	13	21.40	21.40	21.60	21.90	22.20	22.30	22.30	22.50	22.70	22.80	22.90	23.10	23.20	317
	15	21.30	21.30	21.50	21.80	22.00	22.20	22.30	22.40	22.50	22.60	22.70	22.90	23.00	417
	16	20.70	20.70	20.90	21.00	21.20	21.40	21.60	21.70	21.80	21.90	22.00	22.10	22.20	1,698
	17	20.60	20.60	20.80	21.00	21.30	21.50	21.60	21.70	21.80	21.90	22.00	22.10	22.20	1,118
	18	19.90	19.90	20.10	20.40	20.60	20.70	20.80	20.90	21.10	21.30	21.40	21.50	21.60	1,431
	19	19.40	19.40	19.60	19.90	20.10	20.30	20.40	20.50	20.60	20.70	20.80	20.90	21.00	1,814

*In lots of 2½ tons each

CATALPO
for
Treads

Rubber Goods and Specialties

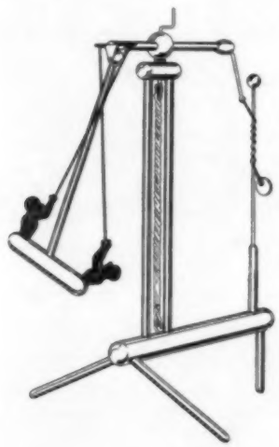
Seiberling Golf Ball

A new golf ball designed to sell at a popular price has been recently placed before the trade by the Seiberling Latex Products Company, Akron, O. The Hornet golf ball, as it is termed, is the same size as any regulation ball and weighs about 1½ ounces. The cover is of genuine balata of a very

tough quality and is extremely difficult to cut. The ball is reported to be very good for distance drives and true in flight and roll. Three of these balls are packed in a handy carton, and 12 cartons in an attractive display container. According to the company, economies in manufacture have made possible a ball of this quality at a popular selling price.

Tinker Go-Round

An old principle, newly applied, is the basis of this novel and amusing toy for children. Known as the Tinker Go-Round, this toy is said by its manufacturers, the Toy Tinkers, Inc., Evanston, Ill., to run 10



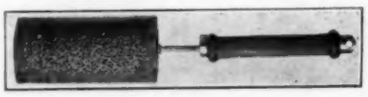
minutes with one winding through its pure gum elastic motive power. The toy has several different motions in effect at one time, including rotary, reciprocal and spiral. The rubber elastic is readily replaced, and the toy, which is boxed partially knocked down, is easily assembled. It is attractively painted and strongly built. The weight of one dozen toys packed for shipment is 10 pounds.

Dirigible Toy

Prominent among the more than 150 inflated rubber toys now being produced and marketed by the Miller Rubber Company of New York, Akron, O., is a new Los Angeles type miniature dirigible. This attracted considerable attention when recently exhibited at the 1929 Toy Fairs in New York and Chicago. It measures almost fifteen inches in length when deflated and is much larger when blown up to full size. This toy is handsomely printed in blue on the white or ivory colored rubber, and this fact has made it a popular item for dealers to display on their counters and in their show windows. The pure gum rubber used in the manufacture of the toy is of the best quality and the workmanship is equal to that in all Miller products.

Rubber Dishwasher

According to the manufacturers, the Kristee Manufacturing Company, Akron, O., this device will satisfactorily clean the dishes, scrape the pans and wash bottles, thus performing the services that previously required three unwieldy implements. This Kristee Speed-Easy dishwasher consists of



a durable sponge rubber washer fitted with a comfortable, non-slipping rubber handle. By means of an ingenious, patented sliding handle arrangement, it can be converted instantly to a practical pan scraper and with another change becomes an efficient device for washing out milk bottles, fruit jars, etc.

Swimming Belt

Equally useful as a seat on shore or in a boat or canoe, this Oso-Soft pneumatic rubber cushion may also be used in emergencies as an ideal life preserver. It is manufactured by the Eno Rubber Corporation, 1726

South Los Angeles street, Los Angeles, Cal., as a part of that company's extensive line of air cushion products. This swimming belt, which is six inches in width and thirty-three inches in length, is adaptable for use in teaching swimming to beginners. It weighs fourteen ounces, and a larger size, forty-two inches in length, weighs seventeen ounces.

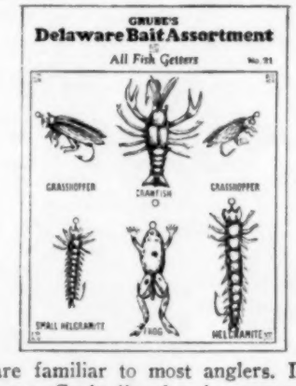
Bathing Combination

In this combination, the Omo Manufacturing Company, Middletown, Conn., offers a bathing cap, bag and belt together. Heavy, narrow strips on the cap brim hold the belt, which serves as a handle when the cap is used as a bag. With the belt in use, the brim is turned back and the bottom of the bag

forms the crown of the cap. The rubber used is of heavy weight and, when the cap is employed as a bag, it can hold a bathing suit and other accessories comfortably and without strain. The combination is packed for dealers in boxes of a dozen. It is also sold together with a pure gum rubber beach jacket and a rubber play ball as a special "beach ensemble" at an attractive price.

Rubber Bait Assortment

Among the new 1929 items that W. J. Grube, Delaware, O., is offering to the sporting goods trade is this assortment of rubber fish lures mounted on a display card. The six baits shown are all popular types



and are familiar to most anglers. Included in the new Grube line for the current season is what is said to be the first successful casting Helgramite with spinner attached. This bait is made of pure soft rubber on top metal under side, the effect being a big fat Helgramite. Another novelty is the new hollow rubber minnow, this bait being two and a quarter inches long and fitted with either Number 6 or Number 4 treble hook attached to wire cable loop. This minnow is also finished in rainbow trout colors very attractively painted.

MILLER PREPARES PLANS FOR SERVICE STATIONS

The Miller Rubber Company, Akron, O., has just completed the preparation of a "Service Station Plan Book," designed for use by its distributors in laying out their places of business. In 32 pages, the booklet, which is 9½ by 13 inches in size and printed on fine book paper, describes 11 typical service stations ranging in building cost from $4,000 to $60,000. The costs are figured on building expenses in Akron.

All the plans are based on the "one stop" idea and combine gasoline pumps, air pumps, oiling and greasing pits, vulcanizing and tire repairing rooms with tire display and sales space. The drawings and floor plans were made by Maxwell A. Norcross, a prominent Cleveland architect, after thorough study and investigation.

C. W. Seiberling Named Trustee

Charles W. Seiberling, vice-president of the Seiberling Rubber Company, was recommended to succeed David Ladd Rockwell as trustee of Kent State College by Governor Myers Y. Cooper on April 2. The appointment will be for a term expiring May 17, 1933.

DR. WOLFGANG KLEMPERER of the Goodyear-Zeppelin Corporation spoke on "Gliding and Soaring" at the conference of the National Glider Association in Cleveland on April 10. He is chairman of the technical committee of the association and is the holder of German glider's pilot license No. 1.

The Philadelphia Rubber Works Company

Manufacturer of

RECLAIMED RUBBER

of

STANDARDIZED QUALITY

NEW YORK
52 Vanderbilt Ave.

AKRON, OHIO

OAKS, PA.
(Montgomery County)

CLASSIFIED ADVERTISING

Five cents a word, minimum charge $2.00, payable in advance.
Address replies to Box Numbers
THE RUBBER AGE
250 West 57th St., New York City

HELP WANTED

WANTED—Man with experience in the manufacture of surgical adhesive tape. State fully qualifications, salary expected. Address Box 513, THE RUBBER AGE.

WANTED—High grade man for position of superintendent of rubber specialty factory located in western New York State. Must have thorough practical experience in molded, tubed, wrapped and punched goods and proven executive ability. Reply, describing capabilities and history in full. Address Box 514, THE RUBBER AGE.

AGENT

Switzerland
India Rubber—Elastic Thread

OLD ESTABLISHED Swiss firm (yarns) with thorough experience in the India rubber thread trade and very well known to all elastic wearings and knitting works in Switzerland, wishes to represent a leading American firm manufacturing elastic thread.

Address—O. R. E. Hauptpostfach,
4300 Zurich, Switzerland.

CATALPO

for

Frictions

Consulting Rubber Technologist

PRACTICAL

Twenty years' experience with the largest and most successful companies in the country

Physical and Chemical Testing

Special facilities for abrasion and quick age tests

Expert Advice to Correct Factory Trouble

New Processes and Formulas Developed

R. R. Olin Laboratories

P. O. Box 372, AKRON, OHIO
Telephones: Barberton 828, Portage 5895W

FLUXRITE

"THE IDEAL RUBBER SOFTENER—A GRADE FOR EVERY USE"

The name DAMASCUS on softeners means the same as Sterling does on silver or 18 Karat on gold

Specialists in Softeners—Get Acquainted with Them

DAMASCUS MANUFACTURING CORP.

CLEVELAND, OHIO

NEW JERSEY TERRITORY: H. M. Royal, Inc., Trenton

WHITTAKER

ESTABLISHED 1890

Standard for 39 years

MINERALS-COLORS
CHEMICALS

Whittaker, Clark & Daniels, Inc.

IMPORTERS—MANUFACTURERS—EXPORTERS

245 FRONT ST. NEW YORK CITY

The Franz Foundry & Machine Co.

AKRON, OHIO

Mold Equipment
Retread Equipment
Engraving Machines
India Core and Chucks
India Self-Acting Drums
Watchcase Vulcanizers
General Machine Work

The CARTER BELL MFG CO

CARTER BELL STANDARD SINCE 1903 RUBBER SUBSTITUTES

150 Nassau Street New York

SCOTT

Machines mechanically accurate, simple in design, easy to read and easy to operate—for testing purposes in material standard departments, purchasing departments, industrial laboratories, etc. If you are not already familiar with Scott Testers write for descriptive literature.

HENRY L. SCOTT COMPANY
PROVIDENCE, R. I.

TESTERS

SCRAP RUBBER

We buy and sell all grades of Scrap Rubber
Let us have your inquiries

JOSEPH CHALFIN, Inc., 274 Madison Ave., New York, N. Y.

A. B. C., fourth, fifth and sixth editions. Lieber's and private codes used. Waste Merchants' standard code. Bentley's code.
Cable Address—Chalfino, New York

INTERNATIONAL PULP CO., *41 Park Row, New York, N. Y.*

SOLE PRODUCERS OF PURE ASBESTINE SPECIALLY PREPARED FOR USE IN RUBBER

Covered and Protected by Letters Patent Registered at U. S. Patent Office, Washington, D. C.

LIBERAL WORKING SAMPLE FURNISHED FREE

LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

NEW YORK, APRIL 19, 1929

COTTON

DESPITE a strong statistical position, cotton prices are following their usual course in seeking the lower levels always to be found at the present time of the year. Cotton future quotations during May have always sunk to a low point in every year of the present century, and in 23 of the 29 years the low point was reached during the first half of the month. The gradual decline from 21.65 cents a pound early in March to 20.40 cents a pound at the present time indicates that this usual drop to May bargain levels is about to take place.

The available supply of cotton in the United States on April 1 was 5,780,694 bales against 6,419,572 bales at the same time last year, a decrease of 639,000 bales or 10 per cent. Heavy rains and greater prevalence of weevils throughout the cotton belt do not indicate a crop of heavy proportions. On the other hand, the textile situation is returning to normal and market students still consider that only a crop of 15,000,000 bales can keep prices down in months to come.

High, low and closing prices quoted on April 19 were as follows:

	High	Low Apr. 19	Close	Close Apr. 3
April	20.20	20.20	20.05	20.20
May	20.34	20.15	20.15	20.30
July	19.69	19.48	19.48	19.77

Tire Fabrics

According to the statistics compiled by the Rubber Association of America, Inc., consumption of cotton fabric in tires has proceeded at a rate that would indicate the use of at least 81,000,000 pounds during the first quarter of the year. This volume is well ahead of that of a year ago.

CORD			
Peeler, carded, 23/5/3	lb.	.47½@	.48½
Peeler, carded, 23/4/3	lb.	.48½@	.49½
Peeler, carded, 13/3/3	lb.	.45 @	.45½
Peeler, carded, 15/3/3	lb.	.45½@	.46
Egyptian, carded, 23/5/3	lb.	.54 @	.54½
Egyptian, combed, 23/5/3	lb.	.58 @	.59
CHAFERS			
Carded, American, 8 oz.	lb.	.40½@	.41½
Carded, American 10 oz.	lb.	.41½@	.42½
Carded, American, 12 oz.	lb.	.41½@	.45
Carded, American, 14 oz.	lb.	.40 @	.46
LENO BREAKER			
Carded, American, 8¼ oz.	lb.	.41 @	.46
Carded, American, 10¼ oz.	lb.	.41 @	.46
SQUARE WOVEN			
Carded American, 17¼ oz. 22-11 ply	lb.	.47 @	.48
Carded American, 17¼ oz. 10-ply	lb.	.40 @	.41

Sheetings

With trading practically at the same level as during late March, price quotations on the various grades of sheetings declined slightly during the fortnight. Prices, as reported by the Textile Brokers Association, Inc., were as follows:

40-inch, 2.50-yard	yd.	.12¾@	.13
40-inch, 2.85-yard	yd.	.11¼@	.11⅝
40-inch, 3.15-yard	yd.	@	.11⅛
40-inch, 3.60-yard	yd.	.09⅝@	.09⅞
40-inch, 3.75-yard	yd.	.08½@	.08⅝
40-inch, 4.25-yard	yd.	.07½@	.07⅝

Ducks

Trading in the various grades of cotton duck has become an inactive affair, with prices remaining unchanged from week to week. The advances recently sought on hose and belting duck have not been obtained, and these mills have been forced to drop back to the general level in their quotations. There is at present little indication of a renewed effort to secure higher prices and at the same time no sign of any likelihood of reductions. The latest price quotations were as follows:

Belting and Hose	lb.	@	.38
Enameling	lb.	.36½@	.38
Single filling	lb.	.14¾@	.16½
Double filling	lb.	.17½@	.18½

RECLAIMED RUBBER

Despite the fact that crude rubber has declined six and a half cents a pound in price since the end of February, reclaimed rubber quotations are still ready at the same levels, thus furnishing proof of their independence of the fluctuations in price of the crude commodity. Demand has been just as firm, despite the low-priced crude rubber to be had, and both old and new mills are working close to capacity to keep up with the present record rate of consumption.

High Tensile			
Super-Reclaim No. 1 Black	lb.	.13 @	.13½
Super-Reclaim No. 2 Black	lb.	.12 @	.12½
High Tensile Red	lb.	.13 @	.13½
Shoe			
Unwashed	lb.	.07¼@	.07½
Washed	lb.	.10 @	.10¾
Tube			
No. 1 (Floating)	lb.	.14 @	.14½
No. 2 (compounded)	lb.	.11 @	.11½
Tires			
Black, washed		.09¾@	.10¼
Black, unwashed		.08 @	.08½
Black, selected tires	lb.	.08½@	.09
Dark Gray	lb.	.10 @	.10½
Light Gray	lb.	.12 @	.12½
White	lb.	.13 @	.13½
Truck, Heavy Gravity	lb.	.07 @	.07¼
Truck, Light Gravity	lb.	.07½@	.07¾
Miscellaneous			
Mechanical Blends	lb.	.07 @	.07½
Red	lb.	.12½@	.13

Scrap Rubber

Somewhat lower price quotations on certain grades of rubber scrap were noticeable at the end of the period. Clean solid truck tires and boots and shoes had declined perceptibly, while there were fractional reductions on the No. 2 grade of inner tubes. Spring collections have been fairly high, but the demand from reclaiming mills shows little sign of slackening.

(Prices to Consumer)

Auto tire peelings	ton	42.50	@45.00
Standard White auto	ton	47.50	@50.00
Mixed auto	ton	26.00	@27.00
Bicycle tires	ton	20.00	@22.50
Clean solid truck tires	ton	22.00	@24.00
Boots and shoes	cwt.	1.45	@ 1.50
Arctics, untrimmed	lb.	.00⅝@	.00⅞
Inner tubes, No. 1	lb.	.07½@	.07¾
Inner tubes, No. 2, compounded	lb.	.04¼@	.04⅝
Inner Tubes, Red	lb.	.05⅛@	.05⅝
Air Brake Hose	ton	34.00	@35.00
Rubber Hose	ton	17.50	@20.00

CRUDE RUBBER

CONSUMPTION of crude rubber during the first quarter of 1929 set a new record at 129,326 long tons, but this was offset, however, by an increase of 10,000 tons in stocks on hand and in transit during the past month, and by large increases in manufacturers' inventories of tires and inner tubes. Bearish sentiment was further accentuated by reports of large shipments of crude rubber from the East and by London advices that the unrestricted Malayan output will probably exceed earlier expectations.

Rubber has consequently declined during the fortnight from 22 cents a pound to a price below the 20-cent level, the lowest quotations in three months. While rubber shows no immediate prospect of going still lower, there is no hint of bullish sentiment in the New York outside market or on any of the exchanges.

While it is felt that the record first quarter consumption will not be equalled again this year, it is generally considered that the balance of 1929 will see domestic absorption at least on a par with the average rate through 1928. The expected curtailment of motor car production after the March record of 625,000 cars and trucks in the United States and Canada will have its effect on tire production, but will not affect the great replacement market or the increasing export field.

Prices on the New York outside market on April 19 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Apr.		.19½@	.19¾
May-June		.19¾@	.20
July-Sept.		.20¼@	.20½
First Latex, crepe spot		.20 @	.20¼
Amber Crepe, No. 2		.18 @	.18¼
Amber Crepe, No. 3		.17¾@	.18
Amber Crepe, No. 4		.17½@	.17¾
Brown Crepe, Clean, thin		.17¾@	.18
Brown Crepe, specky		.17½@	.17¾
Liquid Latex, per gal.		1.00	
Paras—			
Up-river Fine		.21½@	.21¾
Up-river Medium		Nominal	
Up-river Coarse		.12½@	.12¾
Acre Bolivian, fine		.22 @	.22¼
Caucho Ball, Upper		.12½@	.12¾
Islands, fine		Nominal	
Centrals—			
Central, scrap		@	.14
Esmeraldas		@	.14
Balata—			
Block, Colombia		Nominal	
Block, Cuidad		.50 @	—

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Spot-Apr.		@	9⅞d
May-June		9⅞@	10 d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot		@	9½d

The Unexcelled Softener

ARLINGTON MILLS

DEGRAS

PURE WOOL GREASE

The Ideal Emollient for
overcoming the surface tension of carbon black and effecting its complete and rapid dispersion in the rubber stock.

W. L. Montgomery & Co.
Sole Selling Agents
10 HIGH ST. BOSTON, MASS.

SINCE 1880 GUARANTEED

Rand RUBBER GOODS

Dress Shields	Pure Rubber Sheets
Rubber Sheetings	Rubber Bibs
Bunny Baby Pants	Crib Sheets
Sanitary Requisites	Bathing Caps
Guimps & Brassieres	Rubber Specialties
Randprint Aprons	Powder Puff Pockets
All Styles Rubber Aprons	Randprint Rubber

SHEET GUM cut to pattern for manufacturers

"They Last Longer"

Made by
RAND RUBBER COMPANY, Inc.
Formerly Brooklyn Shield & Rubber Co., BROOKLYN, N. Y.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, of THE RUBBER AGE, Published semi-monthly at New Brunswick, N. J., for April 1, 1929.

State of New York } ss
County of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared Peter P. Pinto, who, having been duly sworn according to law, deposes and says that he is the Business Manager of THE RUBBER AGE and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers, are:

Publisher, Palmerton Publishing Company, Inc., 250 W. 57th St., New York City; Editor, none; Managing Editor, J. P. Bushnell, 250 West 57th Street, New York City; Business Manager, Peter P. Pinto, 250 W. 57th St., New York City.

2. That the owner is, (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given).

Palmerton Publishing Company, Inc., 250 W. 57th St., New York City; P. L. Palmerton, 250 W. 57th St., New York City; Earl D. Osborn, 40 East 36th St., New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contains statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stocks, bonds, or other securities than as so stated by him.

Peter P. Pinto, Business Manager.

Sworn to and subscribed before me this 26th day of March, 1929,
[seal] HANNAH GOLDENSON, Notary Public.
(My commission expires March 30, 1930.)

EMBOSSING CALENDERS

For Artificial Leather, Oil Cloth, Carriage and Automobile Covers

DRYING MACHINES

with Copper or tinned iron Cylinders for Cotton Ducks, Drills and Sheetings

The Textile-Finishing Machinery Co.
OFFICE, No. 83 EXCHANGE PLACE
PROVIDENCE, R. I.

FACTICE GIVES

RUBBER FACTICE OF HIGHEST QUALITY THE STAMFORD FACTICE STAMFORD CONN THE STAMFORD RUBBER SUPPLY CO

That Velvet Feel to Rubber

The STAMFORD RUBBER SUPPLY COMPANY
STAMFORD, CONN.

The

GENERAL

TIRE

—goes a long way to make friends

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE AND RUBBER CO.

LATE RUBBER CHEMICAL PRICES

Accelerators — Colors — Softeners — Compounding Materials

NEW YORK, APRIL 19, 1929

QUOTATIONS for rubber chemicals have remained unchanged through the past fortnight, the steady balance between supply and demand continuing. Record rubber consumption in the United States during March brought a new record absorption of rubber chemicals, and only slight slackening up in this heavy use of compounding ingredients is looked for during April and early May.

The Rubber Service Laboratories Company, Akron, O., has introduced a new delayed action accelerator to the trade under the name of Ureka and this has been reported as selling well during the second half of the month. The trend toward chemical company mergers has continued with the acquisition of the Krebs Pigment & Chemical Company, Newport, Del., by E. I. du Pont de Nemours & Co. As in the case of the Grasselli merger, the present heads will continue in charge of the Krebs organization and there will be no change in the company's manufacturing policies.

ACCELERATORS

Organic			
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
Aero-X	lb.	.60 @	.65
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16¼
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolylguanidine	lb.	.42 @	.52
Diphenylguanidine	lb.	.30 @	.36
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde Aniline	lb.	.34 @	.44
Grasselerator 102	lb.		
Grasselerator 552	lb.		
Grasselerator 808	lb.		
Grasselerator 833	lb.		
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.62½@	.65
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.35 @	.45
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92 @	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45 @	4.60
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
Safex	lb.	1.20 @	1.25
Sensilac, No. 89	lb.	.50 @	.52½
Tensilac, No. 41	lb.	.50 @	.52½
Thermic F	lb.	.50 @	.55
Thiocarbanilide, drums	lb.	.26½@	.28½
Thionex	lb.		
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.62½
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Waxene	lb.	.30 @	.32
Z 88	lb.	.50 @	.60
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.10½@	.12½
Litharge, domestic	lb.	.09 @	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.35 @	.40
Ultramarine	lb.	.06 @	.30
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.27 @	.31
medium	lb.	.28 @	.31
dark	lb.	.31 @	.34
Chromium Oxide, bbl.	lb.	.31 @	.38
Reds			
Antimony crimson, 15/17	lb.	.44 @	.50
sulfur free	lb.	.52 @	.60
golden 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.12
Domestic (Maroon)	lb.	.08 @	.12
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Venetian red	lb.	.03 @	.06
Vermillion, quicksilver, English	lb.	1.95 @	—
Whites			
Lithopone, Akcolith	lb.	.05 5/5@	.06
Lithopone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox	lb.	.09½@	.10
Cal. Base Pigment	lb.	.10 @	.10½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Zinc Oxide—French Process			
White seal	lb.	.11⅞@	—
Green seal	lb.	.10⅞@	—
Red Seal		.09⅞@	—
Yellows			
Chrome	lb.	.15½@	.16½
Ocher, French medium	lb.	.03½@	.06
domestic	lb.	.01⅝@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate	lb.	.10½@	.12
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	12.00 @	18.00
Western prime white	ton	28.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Blacks			
Arrow "Aerfloted"	lb.	.08½@	.12½
Bone Black	lb.	.07 @	.08½
Carbon, compressed	lb.	.08½@	.12½
Carbon, uncompressed	lb.	.08 @	.12
Drop Black	lb.	.06 @	.10
Fumonex	lb.	.06 @	.09
Gastex	lb.		
Lamp Black	lb.	.12 @	.40
Micronex	lb.	.09 @	.13
Velvetex carbon	lb.	.04½@	.06
Blanc fixe dry f.o.b. works	lb.	.03½@	.03⅝
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk	ton	12.00 @	14.00
Clay, China, domestic	ton	8.00 @	9.00
Aerfloted Suprex	ton	16.00 @	22.00
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Mineral Flour, c. l. fob mine	ton	20.00 @	23.00
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, powdered	ton	65.00 @	80.00
Rotten Stone (powdered)	lb.	.02½@	.04½
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.30 @	3.70
Talc, domestic	ton	12.00 @	15.00
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	—
Superfine	ton	10.00 @	12.00
Witco	ton	12.00 @	—
Wood pulp XXX	ton	45.00 @	—
Wood pulp X	ton	25.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.24 @	.25

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Montezuma, solid	ton	28.00 @	36.00
Montezuma, granulated	ton	32.00 @	42.00
Paradura	ton	62.50 @	65.00
Pioneer, MR, solid	ton	42.00 @	45.00
Pioneer-granulated	ton	52.00 @	55.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 60 degrees	ton	10.50 @	11.50
66 degrees	ton	15.00 @	16.00
Tartaric, crystals	lb.	.37 @	.38
Acids, Fatty			
Stearex	lb.	.15½@	.20
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	
Oils			
Corn, refined, bbls.	lb.	.11 @	.11½
Cottonseed, crude		.08½@	.08¾
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c. l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05 @	.06
Hexalin	lb.	.60 @	—
Acetate	lb.	.70 @	—
Linseed, Raw C.L. bbl.	lb.	.09½@	.10
Palm Lagos	lb.	.07¼@	.07½
Niger	lb.	.07¾@	.08
Vansulol	lb.	.10½@	—
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
dark amber	lb.	.03¾@	.03¾
Pine, steam distilled	gal.	.65 @	.70
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	9.00 @	10.00
Rosin, grade K, 280 lb.	bbl.	8.55 @	—
Pigmentar	gal.	.33 @	.41
Solvenol, drums	gal.	.48 @	.50
Tarol, drums	gal.	.30 @	.35
Tar Retort, 50 gal.	bbl.	12.50 @	13.00
Solvents			
Acetone, pure	lb.	.13 @	
Alcohol denatured, No. 1 bbls.	gal.	.37½@	.44½
Benzol, 90%	gal.	.28 @	—
Carbon bisulphide	lb.	.05½@	.06¼
Carbon tetrachloride	lb.	.06¼@	.07
Motor gasoline, steel bbls.	gal.	.17 @	—
Naptha, solvent	gal.	.35 @	.40
Turpentine, spirits	gal.	.60 @	.64
wood	gal.	.50 @	.54
Waxes			
Beeswax	lb.	.56 @	.58
Carnauba	lb.	.33 @	—
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.07 @	.07½
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c. l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.03¾@	
White crude scale 124/126	lb.	.04 @	
Refined, 125/127	lb.	.05¾@	
Refined, 128/130	lb.	.05½@	
Refined, 135/137	lb.	.07¾@	
Refined, 138/140	lb.	.08¼@	
Miscellaneous			
RSL Mold Solution	gal.	.75 @	.100

ANTI-OXIDANTS

Albasan	lb.	.70 @	.75
Antox	lb.		
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.64 @	—
VGB	lb.	.55 @	.66

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03¼@	.03½
Sulfur flour,			
Refined, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

CONSUMPTION during March of 44,730 tons of rubber by the domestic industry brought the total for the first quarter of 1929 to 129,326 tons, or only slightly below the figure of 130,000 tons estimated by THE RUBBER AGE. This represents a striking advance over the Rubber Association figures for the first quarter of 1928 of 103,558 tons and, if this rate were maintained through the year, would result in a 1929 American consumption in excess of 517,000 tons. Slackening down of motor car production and consequent reduction of tire factory schedules, however, is expected to bring a decrease in rubber absorption during the second half of the year.

Stocks of rubber on hand in the United States and afloat to this country had increased by the end of March to 157,012 tons and are now the highest ever recorded in the history of the domestic industry. Although this increase is not out of proportion to the gain in volume of consumption, the price of crude rubber in the New York outside market has declined to 20 cents a pound as against the average of 24¼ cents through February and March.

The amount of rubber invoiced to the United States is only slightly less than during the past three or four months. Rubber invoiced to this country from London and Liverpool, however, has become practically negligible since the removal of restriction in the Far East. Only 73 tons were shipped to America from these English ports in the six weeks ended April 13 as compared with shipments of 7,997 tons in the six weeks ended April 14, 1928.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

Table of Contents

United States Rubber Imports and Exports
Rubber Consumption in the United States
Rubber Invoiced to the United States
Daily Rubber Prices in New York
Monthly and Annual Rubber Prices
London Official Rubber Prices
Daily Cotton Prices in New York
Stocks of Crude Rubber in the U. S.
Stocks of Crude Rubber in London
Rubber in Singapore and Penang
United States Tire and Tube Statistics
Automobile Production—U. S. and Canada
Rims Inspected and Passed in the U. S.
United States Consumption of Gasoline
Rubber Exports from Producing Countries
Rubber Imports into Consuming Countries

U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1926:							
July	35,820	33,061,281	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1,318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.25	1,437	1,519,870	47.20	35,675
Oct.	29,746	25,320,558	38.49	1,366	1,316,270	43.03	28,110
Nov.	39,155	34,890,536	39.78	1,482	1,411,517	42.51	37,673
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	45.16	35,850
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,671
Nov.	38,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,835	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,905	17.98				
Apr.							
May							
June							

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	16,938	30,106	29,058	29,638	32,196	31,518	34,403	43,002
Feb.	14,767	30,149	25,736	19,761	31,136	30,137	33,702	41,594
Mar.	21,408	36,629	28,385	33,498	32,936	36,141	35,688	44,730
Apr.	19,294	29,085	27,129	34,139	32,696	35,871	32,772	
May	23,246	36,155	25,845	35,322	29,364	34,592	37,333	
June	31,713	24,272	22,753	35,822	28,598	33,801	37,676	
July	24,522	17,685	23,396	36,053	27,577	29,219	37,407	
Aug.	29,631	20,359	28,982	35,909	34,533	33,460	42,927	
Sept.	24,410	17,594	31,497	31,691	32,904	27,214	39,882	
Oct.	26,881	21,321	31,520	29,047	29,836	26,790	40,857	
Nov.	24,950	20,437	27,289	28,853	28,080	26,792	37,461	
Dec.	25,070	31,902	27,199	28,748	26,293	25,492	31,232	
Totals	282,560	305,694	328,769	388,481	366,149	371,027	441,340	

Figures on Quarterly Basis

Quarter	1921	1922	1923	1924	1925	1926	1927	1928
Jan./Mar.			96,776	87,609	95,263	94,301	99,216	103,558
Apr./June	65,463	127,360	89,493	75,674	104,099	87,109	103,242	103,500
July/Sept.			55,621	83,813	99,493	93,793	89,210	117,573
Oct./Dec.	105,962	155,067	63,617	92,656	85,789	83,212	80,860	117,597
Totals	171,425	282,427	305,507	339,752	384,644	358,415	372,528	442,227

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
Jan. 19	9,469	1,231	2,152	211	13,063
Jan. 26	7,163	1,650	2,271	47	11,131
Feb. 2	9,216	1,784	2,612	23	13,635
Feb. 9	8,341	1,066	1,773	65	11,245
Feb. 16	3,771	1,648	1,982	174	7,575
Feb. 23	9,610	559	1,556	55	11,780
Mar. 2	10,200	1,510	3,744	55	15,509
Mar. 9	8,281	1,974	1,974	9	12,238
Mar. 16	7,370	572	1,977	9	9,928
Mar. 23	8,757	754	1,673	.....	11,184
Mar. 30	7,333	923	1,596	45	9,897
Apr. 6	9,234	1,037	1,975	10	12,256
Apr. 13	7,061	458	1,935	.....	9,454

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1926																																
September	40¾	40¾	40¾	—	—	—	40¾	40¾	40	40¾	40¾	—	40¾	40¾	40¼	40¼	40½	40½	—	41	41½	41½	42¾	42¾	42¾	—	43¾	43¾	43¾	43¾	—	41
October	43	43	—	43¾	43¾	42¾	42½	42½	—	—	42¾	—	—	42¾	42¾	43	42½	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42½	42½	42½	42½	—	—	42½
November	41¾	—	41¾	41½	41½	41½	41½	41½	41½	42¾	41½	41½	41½	40¾	40¾	40¾	40½	40½	39½	39½	38¾	38½	38	38½	38	38	38	87	87	87	88½	88¾
December	36¾	37½	37½	37½	—	37	37	37½	37	37	37½	37½	37½	37¾	37¾	38	38	38	38	38	38¾	38½	39	39	39	39	39	39	38½	38¾	—	38¾
1927																																
January	—	38½	39	39	39¼	39¾	40¾	40¾	—	40¾	40¾	40¾	40¾	40¾	40¼	40¼	39¾	40¾	40½	40¾	41¼	42½	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾
February	57¾	57½	57½	57½	57¾	—	57¾	57¾	57¾	—	—	—	—	39¾	39¾	40¾	40¾	40¾	40¾	40¾	40¾	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼
March	59¾	59¾	40	41	41	41	41¾	41¾	41¾	41¾	41¾	41¾	41¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½
April	41¾	41¾	40½	41	41¼	41¼	41	40¾	41¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40½	40½	40½	41	41	40¾	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½
May	—	40½	40¾	40¾	41	89½	89½	89½	89½	87¾	87¾	87¾	87¾	87	87¾	87¾	85½	85½	85½	85½	85½	85½	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	87¼
June	40¾	40¾	40¾	40¾	85¼	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½
July	40¾	85½	85½	85¼	85¼	85¼	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	84½	84½	84½	84½	84½	84½	84½
August	85½	85¼	85¼	85¼	85¼	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	84½	84½	84½	84½	84½	84½	84½
Sept.	84	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84½	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾	84¾
Oct.	85¼	85¼	—	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼	87¼
Nov.	86	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼
Dec.	86	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼	86¼
1928																																
January	—	87½	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾
February	87½	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾
March	29	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾	28¾
April	—	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼	27¼
May	17½	17¾	18¼	19¼	19¼	19¼	19¼	19¼	20	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾
June	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	—	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾
July	—	18½	18½	19	19	19	19	19	19	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼
August	19½	19½	19½	19¾	19¾	19¾	19¾	19¾	20	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾
September	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
October	18¾	18½	18½	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾
November	22¾	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
December	17¾	—	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾
1929																																
January	—	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼
February	22¾	22	—	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼
March	26	26	—	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
April	23	23¼	22¼	22¼	22¼	22¼	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.36
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	——
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	——
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	——
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	——
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	——
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	——
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	——
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	——
Dec.	27.42	26.60	37.88	93.51	38.25	40.63	17.97	——
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	——

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Jan.	Feb.	Mar.	Apr.	Day	Jan.	Feb.	Mar.	Apr.
1	—	11⅛	12⅞	11⅛	17	10¼	—	—	10¼
2	8⅝	11	13½	11¼	18	10⅛	12½	12	10
3	8⅝	—	—	11⅛	19	10⅛	12½	11⅞	—
4	8⅝	10¾	13½	10⅞	20	—	12⅝	11½	—
5	8⅝	11	12¾	10⅞	21	10⅛	12½	11½	—
6	—	10⅞	12¾	11	22	10¼	13	11½	—
7	8¾	10⅞	12⅝	—	23	10⅜	13⅛	11¼	—
8	8⅞	10⅞	12⅝	11	24	11	—	—	—
9	9⅛	11	12⅝	11	25	10⅞	13⅛	11⅛	—
10	9⅛	—	—	11	26	11	13¼	11	—
11	9¾	11⅛	12¾	10⅞	27	—	13¼	11⅛	—
12	10⅝	11	12⅝	10⅞	28	11⅛	12⅞	11	—
13	—	11¼	12⅝	10⅝	29	10⅝	—	—	—
14	10¼	11⅜	12¼	—	30	10¾	—	—	—
15	10	11⅞	12¼	10¾	31	11	—	—	—
16	10⅛	12⅝	12	10⅝					

Average Monthly Price Per Pound

Month	1927 Pence	1928 Pence	1929 Pence	Month	1927 Pence	1928 Pence	1929 Pence
Jan.	19.410	19.310	9.942	Aug.	17.202	9.300	——
Feb.	19.021	15.713	11.875	Sept.	16.293	8.530	——
Mar.	20.125	12.736	12.135	Oct.	16.366	8.807	——
Apr.	19.897	8.864	——	Nov.	18.159	8.596	——
May	19.769	8.845	——	Dec.	19.690	8.570	——
June	17.880	9.293	——	Average for Year	18.375	10.656	——
July	16.770	9.312	——				

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Mar.	Apr.	Day of Month	Mar.	Apr.	Day of Month	Mar.	Apr.
1	20.70	20.75	11	21.45	20.65	21	21.35	——
2	20.80	20.75	12	21.35	20.70	22	21.10	——
3	——	20.40	13	21.45	20.75	23	21.05	——
4	20.90	20.55	14	21.45	——	24	——	——
5	21.30	20.65	15	21.55	20.60	25	20.80	——
6	21.15	20.55	16	21.35	20.55	26	20.75	——
7	21.40	——	17	——	20.45	27	20.85	——
8	21.65	20.65	18	21.05	20.40	28	20.95	——
9	21.65	20.75	19	21.15	——	29	——	——
10	——	20.65	20	21.25	——	30	——	——
						31	——	——

Average Monthly Price Per Pound

Month	1927 Cents	1928 Cents	1929 Cents	Month	1927 Cents	1928 Cents	1929 Cents
Jan.	13.42	19.12	20.22	Aug.	20.04	19.28	——
Feb.	14.10	18.40	20.21	Sept.	21.95	18.67	——
Mar.	14.32	19.38	20.19	Oct.	20.22	19.62	——
Apr.	14.75	20.63	——	Nov.	20.22	19.84	——
May	16.07	21.58	——	Dec.	19.58	20.22	——
June	16.85	21.50	——	Average for Year	17.49	19.97	——
July	18.00	21.36	——				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	76,172	110,244	76,342	45,312	41,256	78,596	121,484	151,500	154,938
Feb.	91,186	108,955	90,058	42,166	43,316	63,825	133,352	152,271	153,883
March	85,740	114,061	100,536	49,600	39,324	56,476	135,340	153,385	157,012
April	92,757	113,083		38,963	33,986		131,720	147,069	
May	94,563	105,356		44,181	34,374		138,744	139,730	
June	89,250	90,198		47,233	40,001		136,483	130,119	
July	98,469	83,242		40,687	42,804		139,056	125,546	
Aug.	96,148	68,994		40,937	51,875		137,085	120,869	
Sept.	97,829	68,851		37,966	48,566		135,793	117,417	
Oct.	97,452	66,421		42,804	41,571		140,256	107,992	
Nov.	101,084	61,956		37,076	68,119		138,110	130,075	
Dec.	100,130	66,166		47,938	68,764		148,068	134,930	

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1921	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	56,573	67,252	73,498	57,460	27,172	9,994	54,994	66,524	25,191
Feb.	59,439	67,623	70,483	56,732	23,425	10,004	58,826	62,964	25,554
Mar.	63,913	66,670	63,438	55,647	18,104	13,127	63,055	58,272	
Apr.	68,759	68,637	58,770	54,559	12,949	18,773	66,897	53,425	
May	70,403	70,146	54,439	51,615	5,895	20,384	67,169	44,628	
June	69,408	71,597	51,050	51,115	5,318	23,984	63,902	38,756	
July	71,065	71,515	49,937	52,073	4,258	27,727	63,717	35,429	
Aug.	73,211	72,112	58,427	49,700	4,619	30,165	64,491	32,084	
Sept.	72,175	70,977	54,523	44,011	5,453	35,077	68,236	31,440	
Oct.	69,229	68,536	58,891	37,523	5,086	42,138	69,569	24,207	
Nov.	70,786	68,548	60,074	33,593	3,869	44,057	67,050	17,775	
Dec.	69,792	72,299	60,246	29,488	5,697	48,918	63,793	19,815	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1928					
April	58,732	58,945	56,819	53,360	——
May	52,015	50,337	48,705	44,628	——
June	43,716	42,683	41,185	40,083	38,611
July	36,915	35,925	35,238	35,445	——
August	34,294	33,649	32,591	32,815	——
September	31,933	31,477	32,110	31,884	31,462
October	29,525	27,370	26,477	24,240	
November	22,919	21,494	20,194	18,724	——
December	16,855	16,517	17,669	18,821	19,727
1929					
January	21,953	23,016	23,547	24,423	——
February	25,389	25,413	24,757	25,005	——
March	25,441	25,920	26,442	27,656	28,077
April	28,934	30,446			

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1927	1928	1929	End of	1927	1928	1929
Jan.	25,440	25,868	29,617	July	22,558	18,663	——
Feb.	26,766	22,867	32,373	Aug.	25,764	18,971	——
Mar.	27,844	20,538	29,437	Sept.	25,178	14,898	——
Apr.	24,543	16,946	——	Oct.	25,790	12,149	——
May	25,133	17,437	——	Nov.	28,369	29,188	——
June	21,898	18,207	——	Dec.	25,798	32,895	——

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1925	26,001,664	66.8	1928	24,247,282	81.6
1928			1929		
July	2,209,692	85.9	January	1,835,207	79.4
August	2,318,898	80.2	February	2,265,024	80.8
September	2,315,604	76.9	March	2,613,389	80.4
October	2,114,611	72.2	April		
November	1,213,245	66.4	May		
December	1,101,193	74.7	June		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1925	1926	1927	1928	1929
January	14,386,000	17,582,000	17,888,000	20,938,000	22,602,000
February	13,210,000	15,814,000	18,240,000	21,136,000	22,776,000
March	14,890,000	19,302,000	22,464,000	24,041,000	
April	19,013,000	20,848,000	23,371,000	25,712,000	
May	20,459,000	24,213,000	26,579,000	27,355,000	
June	20,724,000	23,803,000	27,799,000	29,022,000	
July	22,879,000	24,752,000	29,784,000	30,960,000	
August	22,323,000	26,912,000	29,779,000	33,148,000	
September	20,177,000	22,929,000	28,409,000	29,691,000	
October	19,826,000	23,973,000	25,497,000	30,610,000	
November	18,024,000	20,618,000	24,400,000	26,222,000	
December	17,954,000	21,419,000	23,718,000	26,644,000	
TOTAL	223,865,000	262,165,000	297,928,000	327,932,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	4,965	5,358	6,722	4,932	5,394	6,626	10,432	9,949	13,712
Feb.	5,095	6,363	6,912	4,458	5,031	5,282	11,075	11,721	15,495
Mar.	6,276	6,819		5,701	5,731		11,583	12,389	
Apr	6,299	6,178		5,701	5,812		12,122	12,717	
May	6,151	6,759		5,657	6,457		12,462	13,024	
June	6,202	6,692		6,253	7,117		12,462	12,162	
July	5,087	6,498		5,973	7,895		11,326	11,157	
Aug.	5,752	7,469		6,393	8,403		10,721	10,034	
Sept.	4,822	6,802		5,717	7,145		9,722	9,765	
Oct.	4,773	7,326		4,799	5,717		9,665	11,520	
Nov.	4,502	6,075		4,306	4,998		10,136	12,579	
Dec.	4,497	5,605		4,165	4,591		10,264	13,624	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	5,337	5,441	6,517	6,016	6,072	7,242	15,585	12,982	15,386
Feb.	5,658	6,895	6,769	5,120	5,431	5,278	16,075	14,650	16,999
Mar.	7,184	6,231		6,157	5,731		17,096	15,573	
Apr.	7,373	6,661		6,359	5,702		17,801	16,638	
May	6,737	7,168		6,140	6,300		18,389	17,702	
June	6,306	6,953		6,832	7,136		17,858	17,159	
July	5,284	6,674		7,070	8,729		16,004	14,974	
Aug.	6,480	8,343		7,983	9,350		14,664	13,981	
Sept.	5,651	7,103		6,758	7,154		13,511	13,543	
Oct.	5,065	6,929		5,024	5,662		13,539	15,285	
Nov.	4,775	5,592		4,723	5,002		13,585	15,743	
Dec.	4,969	5,184		4,712	4,858		13,692	16,117	

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	185,246	117,765	17,481	3,786,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927							
July	268,474	236,866	31,608	10,987	8,719	2,268	279,461
Aug.	308,807	274,378	34,429	12,526	10,139	2,387	321,333
Sept.	260,420	226,440	33,980	11,262	8,681	2,581	271,682
Oct.	219,712	183,041	36,671	7,791	6,236	1,555	227,503
Nov.	134,381	109,742	24,639	6,617	5,173	1,444	140,998
Dec.	133,178	105,784	27,394	3,435	2,277	1,158	136,613
TOTAL	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	232,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	237,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,536	13,016	5,520	415,632
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	233,135	205,144	27,991	9,425	6,734	2,691	242,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	28,486	2,801	497,371
March	584,733	513,266	69,559	40,621	32,833	7,788	625,354
April							
May							
June							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]								DUTCH EAST INDIES[3]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[4]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	405,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,166
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,528
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,505	4,813	58,848	82,511	121,770	9,548	21,129	10,690	655,601
1927:															
Jan.	34,946	14,995	19,951	6,697	921	959	585	504	4,187	6,706	10,690	941	3,482	981	56,404
Feb.	27,528	11,697	15,831	3,571	1,469	552	445	360	4,078	6,526	10,585	675	2,104	1,098	47,344
Mar.	41,346	17,464	23,882	7,142	1,124	997	639	432	5,657	7,004	12,905	733	3,178	1,791	65,484
Apr.	29,041	13,069	15,972	3,349	723	984	452	526	4,666	5,531	10,197	557	2,451	1,520	46,928
May	31,393	15,491	15,902	3,124	760	786	415	348	5,430	5,529	13,410	586	2,460	1,207	49,957
June	32,607	14,706	17,901	3,348	856	1,100	539	409	4,818	5,518	9,109	772	889	1,731	46,990
July	23,947	12,697	11,250	4,018	827	859	544	333	4,771	6,142	11,566	519	1,757	1,113	43,699
Aug.	30,371	17,105	13,266	5,357	688	1,133	623	546	4,355	6,682	12,440	716	1,928	969	48,708
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	802	721	591	542	3,810	7,755	13,633	775	2,752	939	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	500	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,768	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,789	16,618	11,171	3,830	1,605	842	581	525	4,851	7,988	11,774	1,100	2,273	1,025	47,565
Feb.	28,848	12,911	15,937	4,947	1,081	667	581	536	4,052	6,757	8,630	787	1,612	1,276	46,860
Mar.	27,879	10,508	17,371	3,683	775	645	581	269	3,999	5,825	9,690	700	2,750	1,211	47,499
Apr.	20,139	9,335	10,804	3,233	789	630	494	258	3,993	5,040	5,499	736	1,014	1,323	33,810
May	26,488	10,350	16,138	3,091	654	842	494	241	4,943	5,355	10,347	717	2,602	1,135	45,994
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	960	40,788
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,893	712	1,732	450	56,936
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,863	969	1,614	494	50,073
Oct.	24,476	12,603	11,873	3,999	864	949	500*	457	5,295	7,474	10,124	513	1,399	732	44,179*
Nov.	68,135	10,436	57,699	8,005	1,048	772	500*	425	4,950	7,902	7,805	943	1,790	623	92,462*
Dec.	66,763	11,122	55,641	7,848	1,113	744	500*	294	5,120	8,792	10,896	948	2,220	588	94,704*
1929:															
Jan.	52,546	13,415	39,131	8,301		873	500*	461	5,640	8,067	11,076	395	2,134		
Feb.	47,926	12,103	35,823	7,114		955	500*	495	6,572	7,511	10,384	965	2,104		
Mar.	49,448	14,553	34,895	6,713								741			

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, and 2,439 in 1927. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, and about ½ ton in 1927. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I" are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, and 84 tons in 1927. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States*	United Kingdom	France (h)	Germany	Canada (ae)	Japan (da)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,594	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	5,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,718	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,123	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,846	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	975	3,149	1,155	1,558	516,493
1926	395,667	24,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,495	2,670	4,018	1,299	1,870	613,649
1927	398,453	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,433	14,112	8,430	7,958	2,243	4,418	3,178	3,138	595,673
1927:															
January	41,815	10,192	3,284	2,481	1,936	1,227	672	803	929	296	192	316	139	100	64,382
February	25,886	7,692	3,263	3,103	2,620	1,902	601	907	460	502	152	336	146	210	47,780
March	32,752	9,049	2,050	3,475	3,760	1,578	852	784	780	454	86	385	137	127	56,269
April	44,627	7,875	2,310	2,393	1,509	2,181	751	1,972	762	448	58	230	177	218	65,541
May	33,736	2,896	2,006	3,380	2,519	1,084	918	887	694	626	-57	335	155	223	49,402
June	31,270	2,282	2,387	3,632	2,086	798	942	1,506	557	583	-17	243	164	183	46,616
July	35,719	1,116	2,384	2,899	2,104	1,505	1,007	415	900	429	66	227	177	236	49,184
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	138	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	624	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
1928:															
Jan.	37,120	1,921	1,764	2,485	2,290	1,361	760	755	802	589	52	261	335	376	50,871
Feb.	30,926	3,143	2,526	2,984	2,553	1,248	437	783	616	599	98	307	296	297	46,813
Mar.	36,893	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,247
April	35,663	—2,280	2,204	2,719	1,938	2,334	1,114	1,820	832	575	280	339	304	159	48,001
May	28,660	—5,322	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	348	743	133	346	251	182	40,063
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	384	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049		766	696	141	527	250	318	59,248
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	53	837	544	31	337	252	282	46,302
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,090	755	639	148	435	263	200	65,617
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481		1,061	749	218				
Feb.	61,331	5,179		4,613							113				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926; to 5,010 tons in 1927; and to 3,076 in 1928.

BOOK REVIEWS

ADVERTISEMENTS WHICH REFLECT THE SCOPE OF R. & H. CHEMICALS AND SERVICE. Published by the Roessler & Hasslacher Chemical Company, New York City. 1929.

Intended as a graphic presentation of the extent of the service offered by the Roessler & Hasslacher Chemical Company and its subsidiaries, this brochure comprises 16 representative 1928 business paper advertisements, a description of 23 booklets issued by the company, and a list of the 41 magazines in which the company's advertising has appeared.

BRITISH COLONIAL OFFICE REPORTS ON THE RUBBER SITUATION. Published by the U. S. Department of Commerce, Washington, D. C. 1929. 35 pp.

Intended as a review of British restriction, this volume is a collection of the published official British documents relating to that subject, with the addition of a few statistical tables showing the effect of restriction on planting and production of rubber and on the use of reclaimed rubber. The first two reports of the Colonial Office Committee state the conditions which led to the adoption of restriction and the latter two papers give the reasons which led to its abandonment.

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,808	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,805	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:	3,075	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
Jan.	432	242,339	27	24,218	588	183,705	150	86,702
Feb.	489	281,295	33	32,165	403	142,621	312	215,085
Mar.	575	365,927	32	26,460	829	388,616	115	57,833
Apr.	512	312,131	47	32,924	592	174,970	68	27,627
May	452	233,414	—	—	679	226,064	100	42,762
June	424	220,081	9	6,799	293	91,152	28	12,374
July	191	100,342	123	46,747	373	113,295	81	27,344
Aug.	—	—	399	165,460	451	126,962	147	60,738
Sept.	—	—	60	38,198	2,028	713,736	125	56,768
Oct.	—	—	121	59,358	429	129,065	239	94,570
Nov.	—	—	59	41,119	472	140,116	88	35,409
Dec.	—	—	83	58,311	522	156,154	145	59,911
1929:								
Jan.	—	—	46	30,374	484	152,260	138	62,950
Feb.	—	—	82	70,209	823	255,594	40	19,806
Mar.	—	—	90	75,444	428	122,026	1	1,140

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption	% to Crude	Stocks*
1919	81,366	73,535	36.3	.....
1920	86,395	75,297	38.4	.....
1921	36,725	41,351	24.1	.....
1922	57,834	54,458	19.3	.....
1923	74,766	69,534	22.7	.....
1927:				
Jan.	16,526	12,374	39.3	25,903
Feb.	15,860	14,424	47.8	27,291
Mar.	16,788	13,528	37.4	27,124
Apr.	14,483	16,677	46.5	25,712
May	16,159	15,754	46.1	26,419
June	16,652	15,547	46.0	25,811
1928:				
Jan.	14,862	18,134	52.7	21,941
Feb.	15,291	16,808	49.9	20,848
Mar.	17,069	18,619	52.2	19,558
Apr.	15,393	17,355	52.9	19,283
May	18,945	18,201	48.8	18,137
June	18,781	16,328	43.4	18,709
1929:				
Jan.	18,685	19,453	45.3	24,394
Feb.	18,094	17,846	42.9	23,305
Mar.	19,984	18,782	41.9	22,076
Apr.				
May				
June				

Year	Production	Consumption	% to Crude	Stocks*
1924	80,079	76,072	22.4	.....
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	23,218
1927	189,144	178,471	47.6	24,980
1928	208,516	200,200	45.4	24,785
July	15,488	13,842	47.4	26,599
Aug.	15,109	15,836	47.3	25,157
Sept.	14,592	14,790	54.3	23,429
Oct.	16,127	17,292	64.5	22,176
Nov.	15,477	14,876	55.5	21,728
Dec.	16,083	13,431	52.7	24,980
July	17,278	17,173	45.9	17,305
Aug.	19,049	15,532	36.2	15,881
Sept.	18,693	16,022	40.2	17,991
Oct.	17,182	16,587	41.7	17,026
Nov.	18,245	16,547	44.2	22,399
Dec.	17,728	12,894	41.3	24,785
July				
Aug.				
Sept.				
Oct.				
Nov.				
Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927.

INDEX TO ADVERTISERS

Anaconda Lead Products Co. 106
Adamson Machine Co. 107
Akron Equipment Co. 70, 107
Albert & Son, L. 107
Aluminum Flake Co. 105
American Cyanamid Co. 92, 106
Anderson-Prichard Oil Corp. 106

Barrett Co., The 70, 106
Binney & Smith Co. ..... Back Cover, 106
Bridgwater Machine Co. 90, 107

Cabot, Inc., Godfrey L. 73, 105
Carrier Engineering Corp. 107
Carter Bell Manufacturing Co., The 101, 106
Chalfin, Inc., Joseph 101, 108
Cleveland Liner & Mfg. Co. 108
Continental Rubber Co. 108
Cooper, Wm., & Nephews 92, 105

Damascus Manuacturing Corp. 101, 106
Dill Manufacturing Co. 66, 108
Dovan Chemical Corp. 70, 105
du Pont de Nemours & Co., E. I. 68, 105

Emerson Apparatus Co. 107

Foote Bros. Gear & Machine Co. 107
Farrel-Birmingham Co., Inc. 107
Franz Foundry & Machine Co. 101, 107

General Tire & Rubber Co. 103, 108
Grasselli Chemical Co. 105
Greef, R. W., & Co. 105
Gross, A., & Co. 106

Hall Co., The C. P. 63, 106
Huber, J. M., Inc. 65, 106

International Pulp Co. 101, 105

Lowe Co., The Clyde E. 107

Maywald, Fredk. J. 108
McNulty, Joseph A. 106
Montgomery, W. L., & Co. 103, 106
Moore & Munger 106
Muehlstein & Co., Inc., H. 108

Nagle Machine Co. 107
National Aniline & Chemical Co. 105
National Rubber Machinery Co. 64, 107
Naugatuck Chemical Co. 74, 105
New Jersey Zinc Co. 106

Olin Laboratories, The R. R. 100, 108

Pequanoc Rubber Co. 108
Philadelphia Rubber Works Co. 100, 108

Rand Rubber Co. 103, 108
Rare Metal Products Co. 105
Roessler & Hasslacher Chemical Co. 116, 105
Royle & Sons, John 90, 107
Rubber Regenerating Co. 108
Rubber Service Laboratories Co., The 106

Schrader's Sons, Inc., A. 108
Scott Co., Henry L. 101, 107
Smith & Smith 108
Southwark Mfg. Co. 106
Spadone Machine Co. 107
Stamford Rubber Supply Co. 103, 106
St. Louis Sulphur and Chemical Co. 106
Surplus Trading Co. 107

Tasco Asphalt Co. 92, 106
Textile Finishing Machine Co., The 103, 107
Thomas, V. G., & Co. 106

United Clay Mines Corp. 105
U. S. Rubber Co. 71, 108
U. S. Rubber Reclaiming Co. 115, 108

Vanderbilt, R. T., & Co. ..... Front Cover, 105

Weber, Hermann 108
West, H. T., Company 106
Whittaker Clark & Daniels, Inc. 101, 105
Williams Foundry & Machine Co., The 69, 107
Wilson Co., C. T. 108
Wishnick-Tumpeer, Inc. 67, 105

CLASSIFIED ADVERTISING—PAGE 100

Institution of the Rubber Industry

The various papers dealing with the scientific and technical aspect of rubber manufacture, together with the discussions thereon, read before the Institution of the Rubber Industry, London, England, appear exclusively in the Institution's official journal—the

"I. R. I. TRANSACTIONS"

The Journal is published six times a year, each issue containing approximately 100 pages of papers of vital interest to all interested in the manufacture and cultivation of Rubber, Gutta Percha and Balata.

Price 4s. 6d. per copy, post free.
£1.7.0. for 6 copies, post free.

Apply for Specimen Copy to W. F. V. Cox
Institution of the Rubber Industry
Faraday House, 10, Charing Cross Road
LONDON, ENGLAND

In the lead for more than 40 Years

GUMMI-ZEITUNG

Trade Journal for the
RUBBER, GUTTA PERCHA, ASBESTOS,
CELLULOID and Allied Industries

Central Organ for the
Whole German Rubber Goods Industry

Published Every Friday

SUBSCRIPTION RATES

In United States ..... RM 32
Domestic ..... RM 24

Sample copy free

WORLD WIDE CIRCULATION

Main Office of GUMMI-ZEITUNG
Berlin SW 19, Krausenstrasse 35/36

Best Advertising Results for all those desiring to make trade connections in Germany in this field.

THE RUBBER AGE

(of London)

THE MONTHLY PUBLICATION
for
ALL BRANCHES OF THE RUBBER INDUSTRY

Circulates Among Raw Rubber Producers,
Importers, Manufacturers
and Dealers

Published on
1st of each month

Subscription 10/- per annum
Single copies 1/3d post free

OFFICES:—43 ESSEX STREET, STRAND, LONDON, W.C.2.